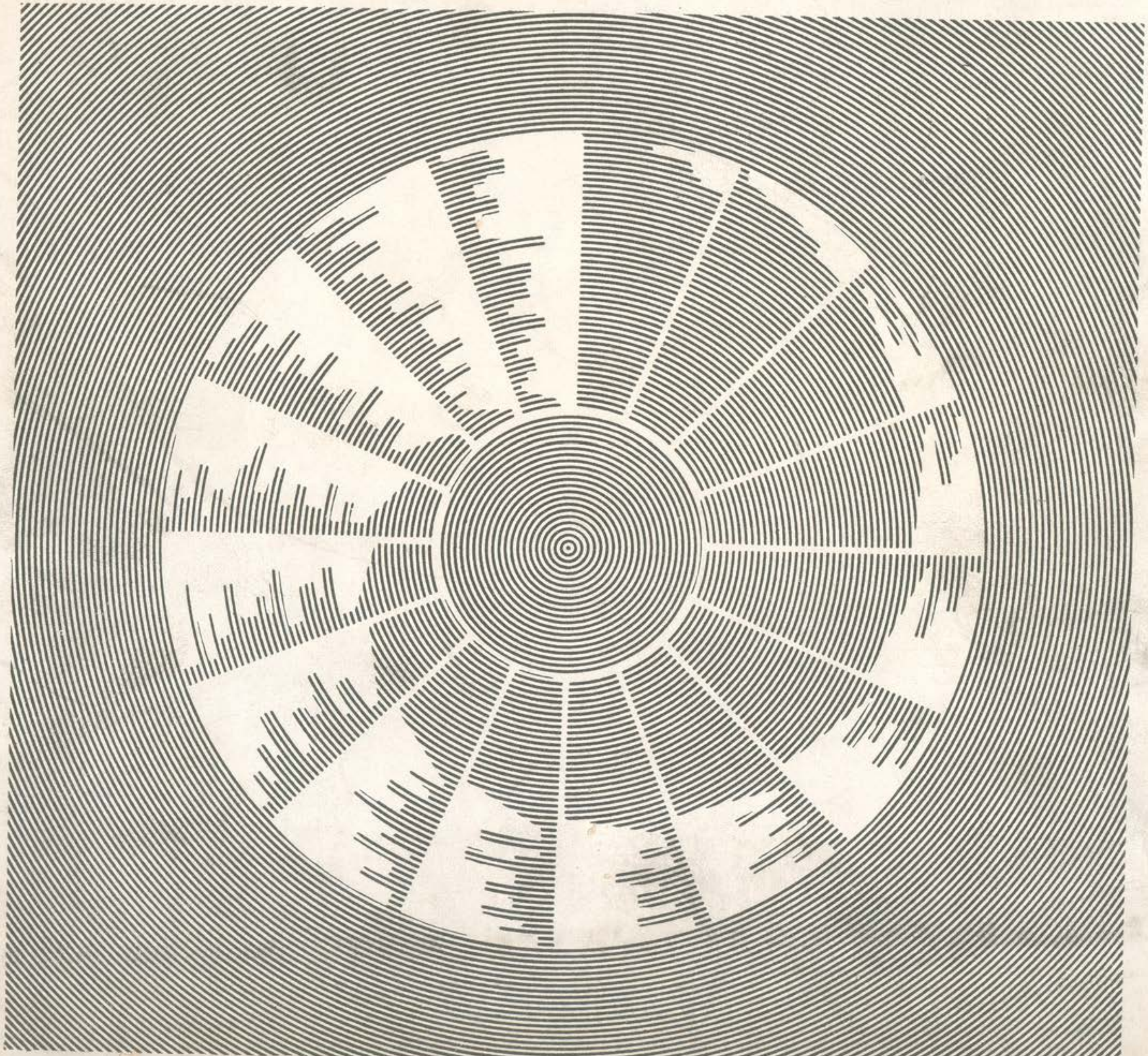
NATIONAL COUNCIL OF SCIENCE MUSEUMS
ANNUAL REPORT 79-80



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INTRODUCTION

The year 1979-80 is significant in the history of Science Museums and Centres in the country. It is the year when, for the first time since the establishment of the first Science Museum of the country two decades ago, such museums/centres were conceived as a powerful tool for social transformation, and some serious thought was given in the planning of new Science Centres in a systematic and meaningful way. The intention was to bring science museums closer to the life of common man through various activity-oriented programmes and didactic exhibits suited to meet the requirements of people from all walks of life.

The first two science museums in the country were set up at Calcutta (1959) and Bangalore (1965), primarily as display houses for marvels of Science and Technology. These museums underwent a radical change during 1965-70 when they provided the necessary infra-structure for launching a massive rural programme through Mobile Science Exhibitions, experimental District Science Centres and other programmes. With the advent of Nehru Science Centre (1977) at Bombay, the museums tended to turn to dynamic Science Centres vibrant with activities. Thus the concept of a science museum was changing through an evolutionary process guided by the requirements both internal and social. Gradually it tended to give up its former role of being a storehouse of artifacts and exhibits and steadily assumed the role of an educator. More and more people were attracted to its non-formal teaching and learning processes.

But the science museums were yet to play the role of a well co-ordinated machine aimed at producing specific goods for specific target groups. Back in 1973 the Planning Commission had foreseen the tremendous potential of a science museum in community development. The Task Force set up by the Planning Commission stipulated the guidelines, area and scope of activities of four major science museums in four zones of the country to support a chain of six regional and twenty district science centres so as to reach the deep interior of the country. The Task Force recommendations also included addition of another 25-30 mobile science exhibitions to the present fleet to supplement the regional and district science centres. The entire idea was to disseminate and diffuse the benefits and possible uses of science in day-to-day life of the community.

It was in 1973 that the Planning Commission Task Force viewed the science museums not as isolated individual showhouses of science but as a moving force which needed consolidation and co-ordination. The Task Force recommended for the creation of a Central Co-ordinating Agency for the planning and management of science museums with arrangements for funding special programmes. This central agency, with required specialisation and expertise and a National Advisory Committee of representatives from all the concerned agencies and organisations to advise the former on the major aspects of policies and programmes, would be responsible for the planning of the network of science museums in the country, ensure effective co-ordination of activities of the individual science museums, and pool the available resources in order to prevent infructuous expenditure on experimentation, design and fabrication of models. At the initial stages of establishment of a new museum this agency will arrange for the shifting and transfer of models, exhibits and personnel from one to the other. Another major responsibility of the central agency will be to plan and facilitate the process of dissemination of services of the science museums to the neighbouring towns and villages. Moreover, the Task Force recommended, this agency will provide for, from time-to-time the scientific evaluation for all, activities and programmes of the museums with a view of improving their effectiveness and the quality of their services. The individual museums however, will develop as autonomous institutions connected through well-defined linkages with the central agency to optimise the limited resources available for the purpose.

The National Council of Science Museums was set up in April 1978 in the same way as the Task Force recommended. The three existing Science Museums/Centres at Calcutta, Bangalore and Bombay were delinked from the CSIR and were brought under the common umbrella of NCSM. Subsequently another unit namely Srikrishna Science Centre, Patna was added to this chain. A Society and a Governing Body have been formed in the line of the National Advisory Committee as the Task Force recommended. The members of the said committees have been chosen from amongst the eminent persons in the country in the fields of science and technology, education, commerce & industry, art & culture and museology. The tasks of planning and establishment of new museums/centres, providing time-to-time guidance to all constituent units in the matters of administration, policy-making, planning of activities etc., monitoring and evaluation of programmes and activities of the constituent units, central planning of exhibits and activities for all new set ups, arranging and mobilising expertise and funds for all programmes and activities of the constituent units etc. have been entrusted to NCSM. The individual units are governed by the respective Executive Committees constituted by the Governing Body of NCSM from amongst the reputed local persons in the fields of science, industry, education, culture and museums. The respective Executive Committees have constituted sub-committees like Finance Committee, Scientific & Programme Committee, Building & Works Committee, Local Advisory Committee etc. from local dignitaries in the concerned fields to assist the former in taking policy decisions in the respective aspects. The constituent units of NCSM thus enjoy complete autonomy in planning, programming and execution of their various programmes and acti-

International year of the child was celebrated by all units of NCSMthrough various programmes.

vities within the stipulated budget and within the framework of activities laid down by the Governing Body of NCSM. The role of NCSM in these regards is mainly to fix the priorities in accordance with the national requirements and provide necessary fund.

The first year of NCSM (1978-79) was mostly spent in organising the new set up. Rules, Regulations and Bye-laws were formed during this period. New Committees like the Society, Governing Body, different Executive and other subcommittees for the constituent units were constituted for policy making and planning. Certain policy decisions like implementation of Task Force recommendations for setting up of a Science Centre of national status at Delhi and 20 District Science Centres in economically backward region of the country were taken in this period. It was at the end of this year that the Governing Body of NCSM took up the decision of establishing the first two District Science Centres at Purulia (West Bengal) and Gulbarga (Karnataka) after evaluating the existing experimental centres there. They also recommended the setting up of two Study Groups, one for District Science Centres and the other for Delhi Science Centre, to advise the NCSM on the methodology of implementation of the projects with particular reference to the objectives laid down for each one of them.

The current year (1979-80) of NCSM was almost entirely spent in implementation of Task Force recommendations. Major programmes undertaken during this year are :

i) Setting up of a large Science Centre at Bombay for catering to the Western Zone of the country.

ii) Planning for a large Science Centre at Delhi for catering to the North Zone of the country.

iii) Planning for a chain of District Science Centres in economically backward regions of the country.

iv) Setting up of Srikrishna Science Centre at Patna as the first Regional Science Centre.

v) Strengthening the museums at Calcutta and Bangalore to support all new developmental activities.

An important step taken by the NCSM while implementing the above programmes was constituting a Study Group for District Science Centres. On the basis of their suggestions an implementation plan (Master Plan) had been prepared. The Study Group identified five backward regions in the country in addition to Purulia and Gulbarga for establishment of District Science Centres. Another major step taken was the appointment of architects for the planning of buildings for the Centres at Purulia and Gulbarga. The plans and estimates submitted by the architects had since been approved. Central planning of exhibits for indoor exhibition halls and outdoor science exposition (Science Park) for both the Centres are on the way.

One of the most remarkable achievements during the period 1979-80 was setting up of a large outdoor science expo—Children Science Park—at Nehru Science Centre, Bombay. Situated in an area of about 4 hectors of land this park houses 64 models, exhibits and artifacts in addition to a life science corner where some tender live animals are kept for display and handling by the children. The basic idea of such a park is to help the children to learn through play. Another notable addition during the year was a new mobile science exhibition unit on Agriculture in Birla Industrial & Technological Museum, Calcutta. This unit with 24 exhibits has been planned in consonance with the thrust envisaged by the Government of India for rural development.

In the light of the International Year of the Child the museums/

centres under the NCSM took up various programmes specially meant for the children. The most remarkable programmes included a competative Students Science Seminar on 'Science—a boon or curse for children' throughout the Eastern India, opening up of children science park in Purulia and Patna, construction of an Animalorium with snake pits, aquarium etc. in BITM, Calcutta, science quiz contest, film show, puppet show, sit and draw competition, paper toy making, electronic games for children etc. in all NCSM Units. The seminar organised by BITM, Calcutta was participated by school students of almost all Eastern India States through a multi-tier contest. A large number of electronic games in the form of table-top exhibits were fabricated and exhibited at different places which brought in profuse amusement for the children.

The NCSM organised in collaboration with UNESCO, ICOM Regional Agency in Asia and Indian National Committee for ICOM, a Workshop on "The Establishment of Science Museums in Asian Countries: Training and Exchange" in February, 1980 at VITM, Bangalore. The Workshop discussed in depth the various aspects in establishment of Science Museums in Asian Countries and was attended by 35 participants from India and abroad.

At the end of its second year of existence the family of the National Council of Science Museums has grown to 7 museums/centres all over the country. Another Centre is presently at the planning stage at Delhi. Various requests are pouring in from different corners of the country for setting up science centres there. It appears that even if only a few requests are acceded to, the size of the NCSM will be atleast doubled by the end of the current five year plan period, with four units at present at the formative stage and many more to come in near future. The Headquarters of NCSM, particularly its Planning, Analysis, Research and Evaluation Cell has to undergo an extremely busy time in providing necessary expertise and guidance to all the new set ups. Central planning of exhibits and activities has to be increased many folds. The existing museums/centres are being strengthened considerably to cope up with the developmental activities. Monitoring and evaluation of activities, programmes and exhibits of all the constituent units has to start immediately so as to modify those to suit the requirements.

OBJECTIVES

(a) To establish, take over and administer new museums or centres of science, technology and industry and like institutions at all levels – national, state, district and block.

(b) To establish centres for development of science exhibits and demonstration aids.

(c) To portray the growth of science and technology and their application in industry and human welfare.

(d) To collect, restore and preserve important historical objects which represent landmarks in the development of science, technology and industry.

(e) To collect, restore and preserve old records and documents relating to the history of science, technology and industry with special reference to India, and to set up an archive for the above purpose.

(f) To establish and maintain research and reference libraries in pursuance of the objects of the Society with reading and study rooms, and to furnish the same with books, reviews, magazines, newspapers and other publications.

(g) To collect and disseminate information in regard to science technology and industrial museums and centres.

(h) To preserve the relics of industrial archaeology as site museums.

(i) To design, develop and fabricate science museum exhibits, demonstration equipments and scientific teaching aids for science education and popularisation of science.

(j) To popularise science and technology in cities, urban and rural areas for the benefit of students and for the common man by organising exhibitions, seminars, popular lectures, science camps and various other programmes.

(k) To supplement science education given in schools and colleges and to organise various out-of-school educational activities to foster a spirit of scientific enquiry and creativity among the students.

(l) To organise training programmes for science teachers/ students / young entrepreneurs / technicians / handicapped / housewives and others on specific subjects of science, technology and industry.

(m) To render assistance to universities, technical institutions, museums, schools and colleges or other bodies in planning and organising science museums and also in training of pesonnel for museum profession.

(n) To conduct research in the history of science and technology with special reference to India.

(o) To establish and award research fellowships and financing of specific researches in relevant fields,

(p) To publish scientific papers, books and journals devoted to the field of museology, history of science and technology and popularisation of science.

PLANNING

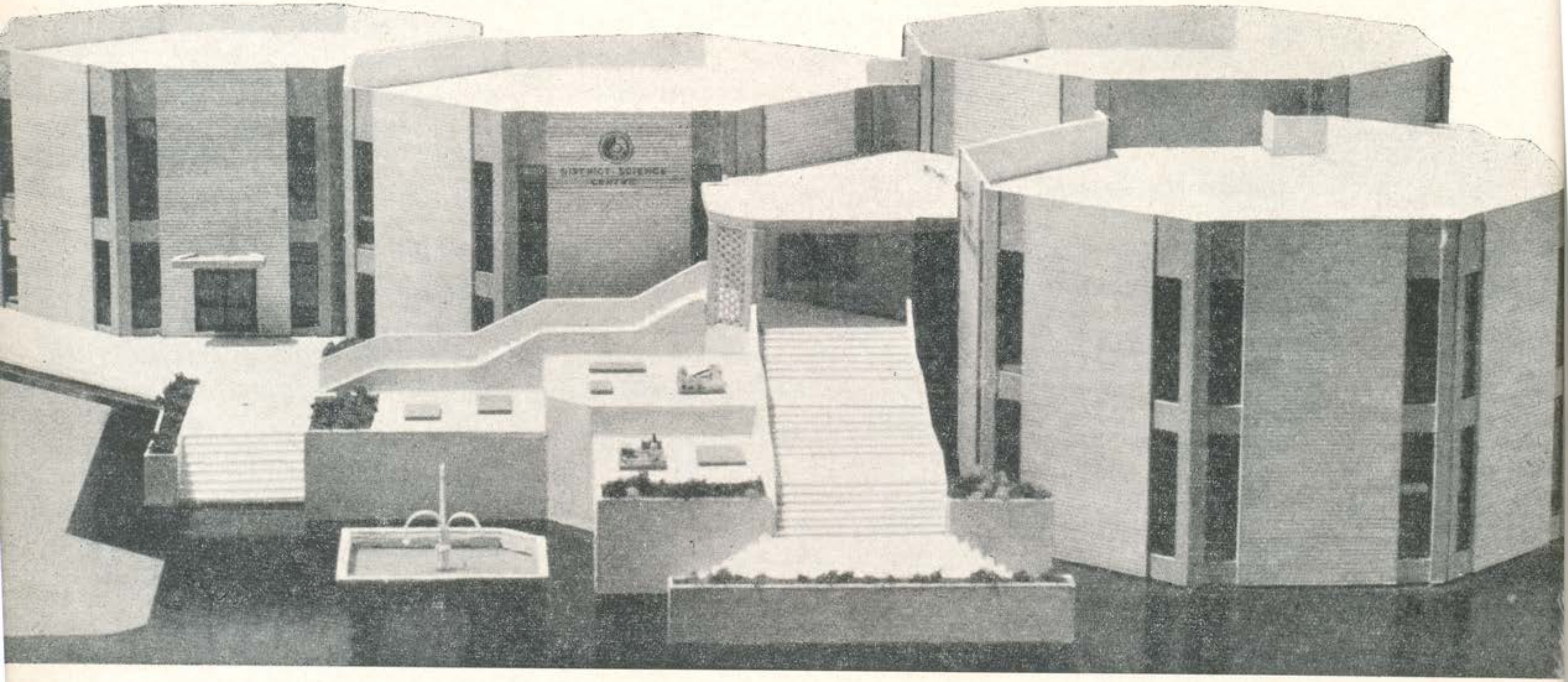
District Science Centre

One of the most significant planning jobs undertaken during the period under consideration is developing the methodology of implementation of the establishment of District Science Centres (DSC) Project which led to the preparation of a Master Plan for the purpose. A Study Group was constituted in April 1979 comprising of experts from various fields all over the country. The Study Group examined relevant documents and deliberated considerably to help in the preparation of the Master Plan. The terms of reference for the Study Group were :

a) **Conceptual development**—to delineate the scope and areas of activities for effective interaction of science, technology and society, keeping in view the requirements of varying cross section of the people in rural areas.

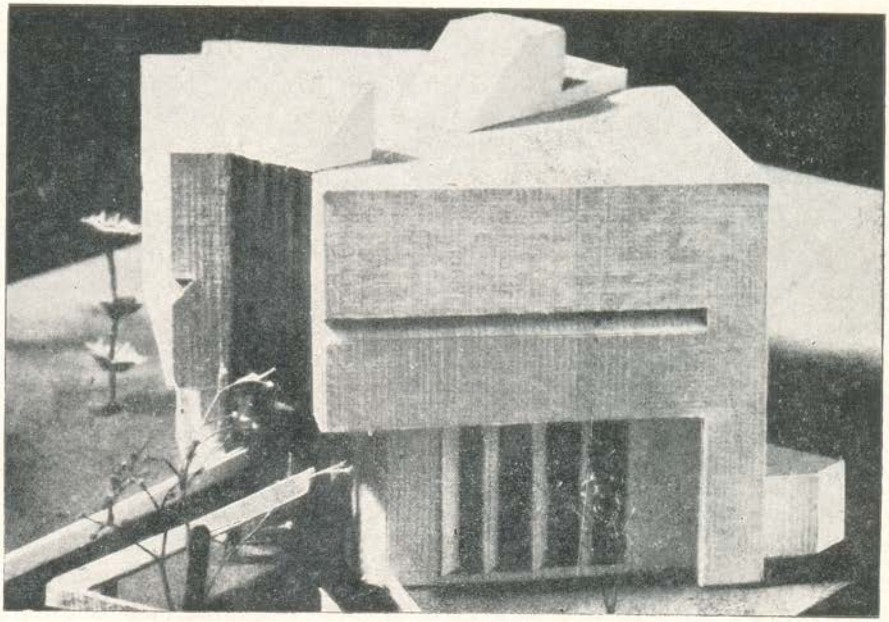
b) **Infrastructure**—to outline an appropriate organisational structure for both central planning at the Headquarters and at individual DSCs, and to assess the financial input.

Architect's View of the building of District Science Centre, Purulia.



c) **Collaboration**—to identify various collaborating agencies for positive involvement in planning, execution and running of programmes.

d) **Selection of sites**—to outline certain backward regions in the country for establishment of the DSCs in the first phase.



Architect's view of the building of the District Science Centre, Gulbarga.

It was decided that in every DSC more stress will be given on activity-oriented programmes rather than on the conventional museum galleries. A new kind of programme has been suggested—Community Science Programme which will be both project-oriented and training-oriented. The project-oriented programmes will involve the local youths in some investigative projects on local problems under the expert guidance from the sponsoring agencies. Their investigation will lead to a report on the cause and remedy of the problems, and a 3-dimensional model for display at the Centre. The training-oriented programmes will aim at imparting training in various disciplines to the people of varying cross section in the district through collaboration from appropriate agencies. In addition, every DSC will organise mobile programmes like Mobile Science Exhibition, Mobile Science Library, Training/Teaching units. Mobile Hobby Centre, Adult Education Kits etc. Each DSC will give equal emphasis on school science programmes like School Loan Service, Science Demonstration Lecture, Creative Ability Centre, Science Quiz, Teachers Training Programme, Science Fairs, Science Camps, Science Seminars etc. to supplement the carriculum teaching in science in the local schools. It was suggested in the Master Plan that land area of minimum 3 acres is necessary for each DSC to function efficiently. It has been decided that the size of the building for each DSC would be of 2000 sq. mts. covered area, to be built in 2 phases. However, a self-contained portion of the building measuring 800 sq. mts. of covered area will be built in the first phase. The detailed requirements (phase-wise) of various services like electricity, telephone, fire fighting equipments, tools and equipments necessary for running the maintenance workshop and other activity oriented programmes, the man power requirements, vehicle etc, has also been shown in the Master Plan. Also the phase-wise financial input has been detailed. In contrast to the conventional museums, every DSC will have in itself two type of exhibitions indoor and outdoor. The outdoor science exhibition (Science Park) will have exhibits on various themes. A life science corner may also be set up in every DSC. It has been proposed that the topic of the first exhibition hall in each

DSC will be on the 'Wealth of the District' which will have in itself exhibits on history, geology, ethnology, flora and fauna, agriculture, health and hygiene, food and nutrition, cottage and heavy industries etc. of the district. It has also been suggested that all the DSCs should follow a common basic core element although each individual DSC should emphasise on topics of local variation and relevance in addition to the core element so as to help scientific activity and pattern being assimilated in the community life there.

In a nutshell, each individual DSC will be unique in its appearance and presentation although the basic objective of every DSC will be the same. A CPM chart has also been prepared for setting up of each DSC so that the work could be undertaken and monitored as per a determined schedule. According to the chart the total time necessary from start to inauguration of each will be only 45 months.

During the current year NCSM gave maximum thrust to the planning of new District Science Centres at Purulia (West Bengal) and Gulbarga (Karnataka). Architects were appointed to plan the buildings. The plans and estimates for both the buildings were also approved and preparation of tender papers were in progress. Side by side land development and planning, designing and fabrication of exhibits for the Science Parks were in progress and installation of exhibits was initiated. Information collection for planning of exhibits for the indoor exhibition halls were also started.

NEHRU SCIENCE CENTRE, BOMBAY

Architect's view of the main building of Nehru Science Centre, Bombay.

The year 1979 has been a year of intensive planning in Nehru Science Centre, Bombay. The detailed design of the main building was finalised, which is planned to be built in five modules covering an area of 22,000 sq. mts. Four of these modules are intended for public exhibition and activity areas and the fifth reserved for service areas. The first phase of construction started in 1979-80 involves a covered area of 10,000 sq. mts. with block 'B' and block 'C' in full and the ground floor auditorium of block 'D' to be constructed. Out of this, about 7000 sq. mts. area is for permanent and temporary exhibitions while the remaining area is reserved for various activities like students' Hobby Centre, Training Halls, Committee rooms, Library Maintenance shop etc. Attention has been given to special requirements for electrical installation, emergency light system, public address system, fire fighting service, emergency alarm system, external and internal telephone, and various visitors amenities. The construction is expected to be completed during 1980-82.

Planning of an exhibit in Nehru Science Centre, Bombay.

A well co-ordinated exhibit development centre has been set up during 1979-80 for undertaking planning and design of exhibits and activities for the centre. The team consists of curators, who provide the concept of the exhibit and mechanical and electronic engineers who work on details of mechanisation and animation. The team is supported by an Exhibition Officer who suggest the mode of presentation. Every individual exhibit is the product of a team work involving scientific thought, engineering skill and artistic imagination.

Plan for the Children Science Park was taken up early during 1979 and continued till the end of 1979, the fabrication work going on side by side. The landscaping of the entire foreground of five acres was taken up, and large size out-door exhibits were planned and designed. Special provisions were made for the life science corner and for the preservation of historic exhibits. The entire planning and design work for about 50 exhibits was taken up departmentally and the master list was prepared for the section "Sound and Hearing", which is planned to come up first in the building under construction.

SHRIKRISHNA SCIENCE CENTRE PATNA.

Shrikrishna Science Centre, Patna, fourth in the chain of Science Museums under NCSM was formaly inaugurated in October 1978 with one temporary exhibition on 'Science for All'. During that year the major activities of the Centre was setting up of the office, infrastructure etc. Only a few educational extension activities meant primarily for school teachers and students like Teachers' Training Programme, Science Demonstration Lectures, Students Science Seminar etc. were held. During the current year (1979-80) maximum thrust was given in detail planning of the first phase of establishment of the Centre. An outdoor science expo (Science Park) was planned to display exhibits on general sciences, astronomy, meteorology, energy, life science etc. A few exhibits were also installed during the period, and a lot more were under fabrication. Planning for the first permanent gallery of the Centre on Popular Science was also completed and fabrication of about a dozen of exhibits were taken up. This gallery, when complete, will be divided into 3 sections. One section will deal with some interesting participatory games for children, another section meant for students will have exhibits on principles of physical sciences, and the last section will explain functions of various scientific gadgets we come across in our everyday life. In addition the Centre is going to have one indoor and another outdoor auditorium each of which will be able to accommodate about 150 persons. The Centre was started in 1978 in a partly unfinished building. During the current year planning for completion of the existing building and development of its surroundings to house the Popular Science Gallery, Science Park etc. were completed. Construction of the remaining portion of the building was taken up and nearly half of the job was over by the time. Fabrication of the exhibits started in sister organisations like NSC, Bombay and BITM, Calcutta. Development of the area earmarked for first phase of setting up of the Science Park was also over.

SCIENCE CENTRE, DELHI.

In consonence with the recommendations of the Task Force of Planning Commission (1973) and the policy decision taken in the first meeting of the Society of NCSM in August 1978, action regarding establishment of a Science Centre of national status at Delhi was initiated during the year. A Study Group was constituted by the Chairman of the Governing Body of NCSM in pursuance of the decision taken in its meeting held on January 18, 1979 comprising experts from various fields to advise the NCSM on the methodology of the implementation of the project with particular reference to the objectives. The Study Group met on October 26, 1979 and submitted their recommendations after considerable deliberations. The Governing Body of NCSM in its meeting held on January 15, 1980, examined the recommendations of the Study Group and approved the setting up of a Planning Cell of NCSM in Delhi to prepare a feasibility report for the project based on Study Group recommendations. Accordingly the Planning Cell with curators and curatorial assistants has since been set up at Delhi to prepare a Master Plan for the project including the architectural concept of the buildings and the exhibits. It is expected that this will be ready by September, 1980.

Manpower Planning

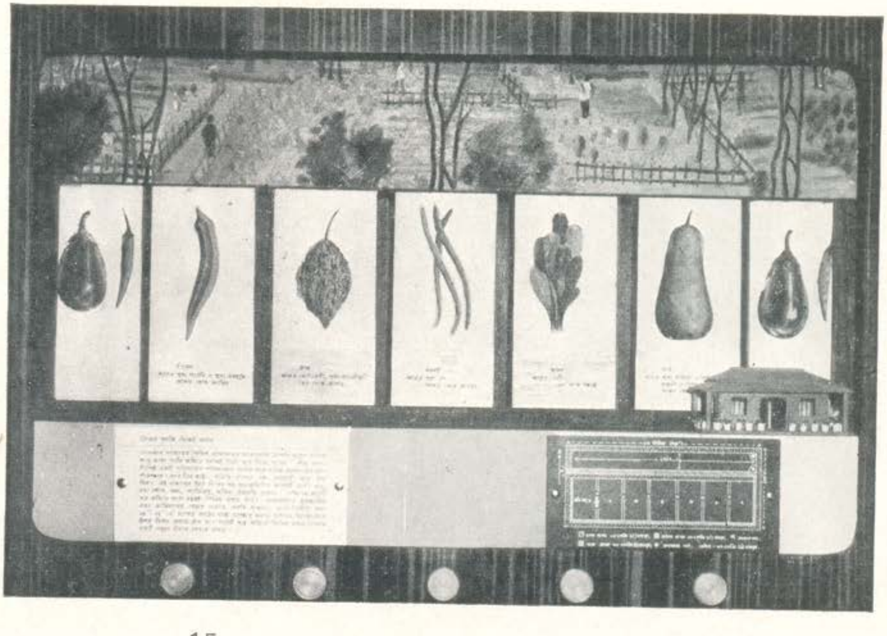
To Meet the growing needs of developmental works, the National Council of Science Museums and its constituent units require a handful of persons who could be entrusted to the job of planning for the developmental works. The success of the entire scheme of developmental projects depends almost entirely on the recruitment of motivated persons who need special exposure and training before assuming responsiblities. With this view in mind, the NCSM took up a central recruitment scheme for filling up the vacant posts of curators and curatorial assistants in the Headquarters and the constituent units. A six months intensive training programme was also organised by the NCSM at its Headquarters for all the new recruitees. The course content of the training included the history and development of museums with particular reference to science museums, the role of science museums, their objectives and functions, role of curatorial staff, classification of science museum exhibits, artifacts, models, participatory exhibits, animated presentations etc., conceptual development of exhibits through various stages leading to its fabrication, handling various equipments and machineries for fabrication of exhibits, different animation techniques, operation of various audio-visual equipments, programming and organising various education extension activities, documentation of exhibits, administrative and routine official procedures, public relations and mass communication systems, modern management techniques including PERT and CPM, methodology of monitoring and evaluation processes etc. The idea of drawing up such an elaborate training programme was to adequately equip the new recruitees with the various methods of working in science museums.

Mobile Science Exhibition

To intensify its programmes for the rural population, the NCSM took up a consolidated planning work through its three units at Calcutta, Bangalore and Bombay in developing three new Mobile Science Exhibition Units on themes (i) Agriculture, (ii) Technology, Society, and Change (iii) Man and His Environment, respectively. During the current year commissioning of the unit on Agriculture was done by BITM, Calcutta. This unit comprising of 24 working models and exhibits portrays the modern method of agriculture as suitable to our country. In brief, the topics covered in this unit are soil testing, fertiliser—both organic and inorganic, tilling equipments and machineries like mould board plough, power tiller, tractor etc., seeds and seed treatment, sowing and interculture machineries, insects and pests, plant protection devices, appropriate use of irrigation water, post-harvest technology, kitchen gardening etc.

Planning and fabrication of 20 exhibits have been completed at VITM, Bangalore for the unit on 'Technology, Society and Change'. The main features of

A typical participatory exhibit in MSE Unit on Agriculture commissioned by BITM during the year.



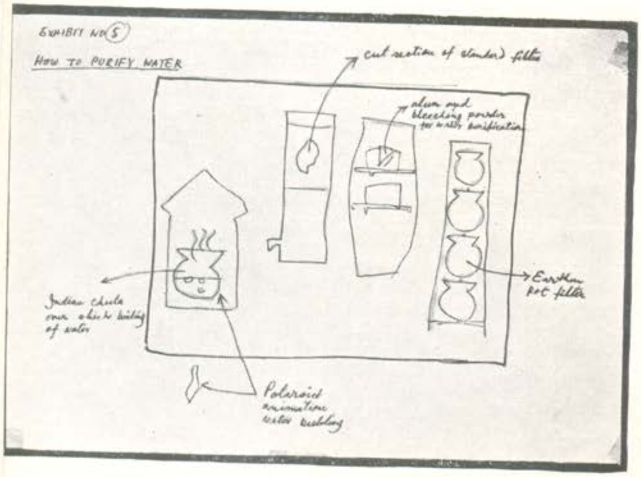
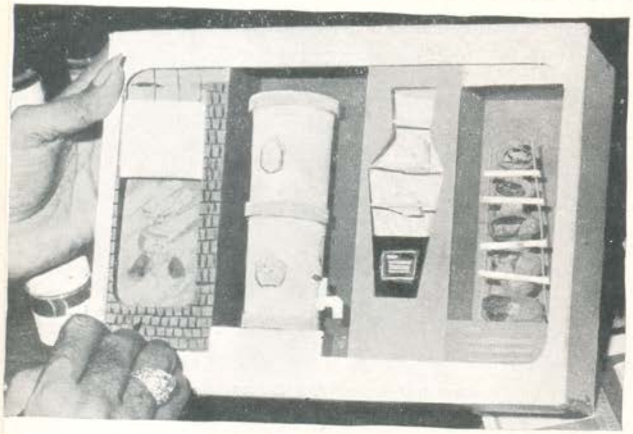
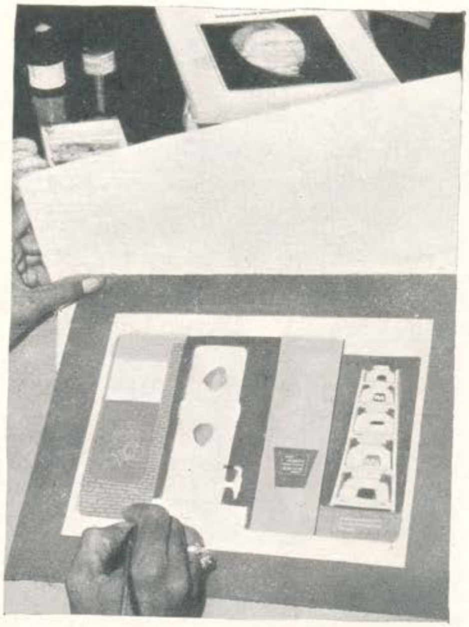


EXHIBIT NO 5
HOW TO PURIFY WATER
cut section of standard filter
alum and bleaching powder for water purification
Earthen pot filter
Indian chula over which boiling of water
Polaroid animation water bubbling

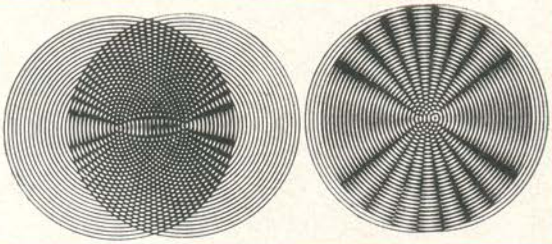




this unit are transport, power, fuel and public health. At Nehru Science Centre, planning of the unit 'Man Must Measure' has been completed. The unit deals with among other things the weather, ecology and ecological balance, environmental pollution and their control. Fabrication of about 50% of the exhibits have also been done during the period under consideration. In addition, planning work for another unit on 'Food and Nutrition' has been taken up at BITM, Calcutta. This unit through various working exhibits and games will introduce to the visitors the various aspects of food and nutrition, balanced food, kitchen hygeine, food preservation, functions of nutrients, food-borne diseases, role of vitamins etc. Fabrication of about 25% of the exhibits have also been initiated during the period.

Development of exhibits is a team work requiring Curators, Exhibition Officers, Mechanical Engineers and Electrnoic Engineers to work side by side.

EXHIBITS



Dissemination, popularisation and non-formal education of science are made through permanent museum galleries of different disciplines. All the galleries have original collections, static and working models, animated posters, diagrams and charts. The exhibits have been arranged chronologically to present a story to the audience. Attempts have been made to incorporate as much working features in the exhibits as possible in all the sections. These features imply a major deviation from the traditional museums in our country. Unlike the style of other museums where exhibits are generally static in nature, in museums/centres under the NCSM most of the exhibits are participatory type, so that they could be more acceptable and understandable to a visitor. Visitors are allowed to operate most of the exhibits and find their answers—the basic what, why and how of every question. Visitors can touch, feel, hear and observe the various functions of these exhibits and transform that very sensation into a non-formal education. Demonstration and explaining of the exhibits to the visitors are done by the guide lecturers of each museum/centre. Visuals, graphics, lights, sound, colours and modern animation techniques have been profusely used to make the galleries more attractive and interesting to all age groups.

There are altogether 24 permanent exhibition halls in the museums/centres under the NCSM.

A Section of the Electricity Gallery completely renovated in BITM.

Tic Tac-Toe—a very attractive participatory exhibit in BITM.

The following are the galleries in different museums/centres of NCSM.

BITM, Calcutta

- Nuclear Physics
- Motive Power
- Transport
- Popular Science
- Mining
- Copper
- Iron & Steel
- Petroleum
- Electricity
- Television & Electronics
- Communication
- Solar Energy

VITM, Bangalore

- Motive Power
- Electrotechnic
- Metals in civilization
- Timber & Paper
- Popular Science

NSC, Bombay

- Light & Sight
- Children Science Park

How the world looks like to a bee or a dog—an exhibit on Light and Sight in NSC Bombay.

SSC, Patna

Science For All
Shri Krishna Singh
Memorial Room

DSC, Gulbarga

Popular Science

DSC, Purulia

Science & Industry

DSC, Malda

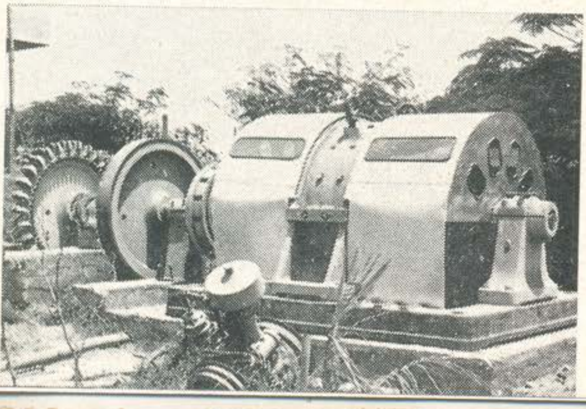
Popular Science

CHILDREN SCIENCE PARK

The most important addition in NCSM museums/centres during 1979-80 is the Children Science Park in NSC, Bombay. To mark the International Year of the Child, the Centre designed and developed a park covering an area of 4 hectors and it was opened to the children on December 22, 1979. This park imparts knowledge in various branches of science through entertainment. Children can go round, learning new things and at the same time enjoying themselves.

The exhibits can be divided into 11 different subjects ; Energy, Life Science, Weather Recording, Water-body, Work, Motion, Kinematics, Light, Sound, Time keeping and original collections of artifacts, in a beautiful green surroundings. A full-scale working Windmill stands centrally in the park. It pumps up water, and is a prominent feature of the Centre. An Archimedean Screw is another interesting exhibit also meant for lifting water. The principle of lever has been shown by a typical exhibit. There are also 'sea-saws' to explain the same principle. The use of inclined planes, hydraulic jacks have also been shown effectively. Transmission of power and use of gears are two very interesting exhibits of the park Speaking tubes used in olden days for communication, and optical Semaphore

Children Science Park inaugurated in Nehru Science Centre, Bombay during the year exposes the children to nature and machines equally

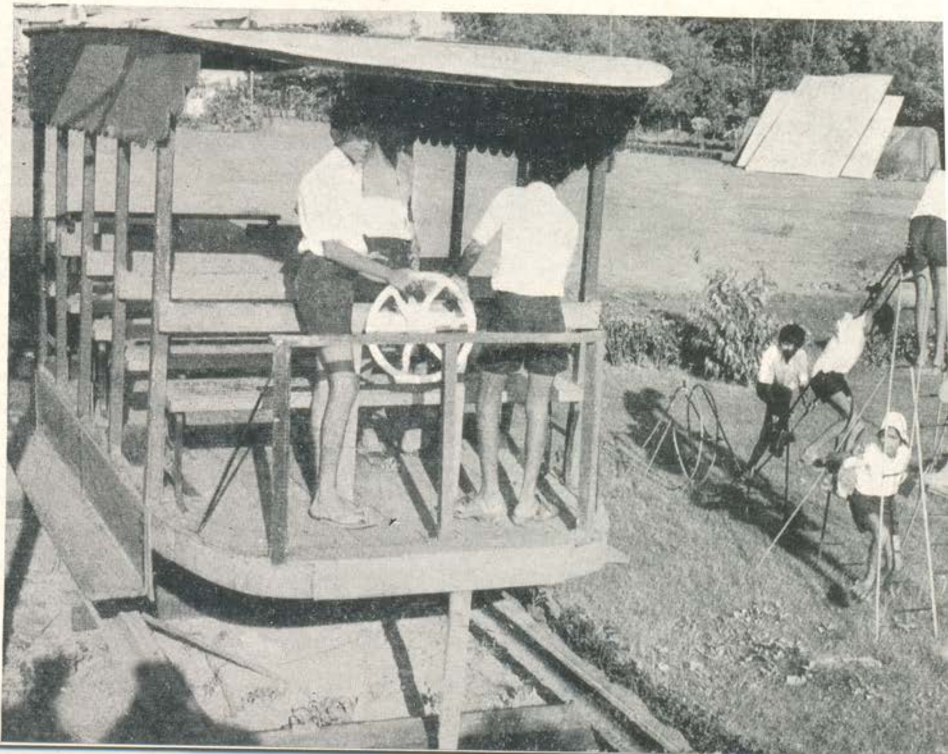


Towers used for transmitting messages over long distances find prominent place in the park. The principle of swing has been demonstrated in one exhibit. Electricity can be generated here by utilising falling water or by driving turbines by steam power. Glimpses of early modes of transport are on display through a precious collection of Horse-drawn–Tram car, Steam-driven Lorry and a Tiger-moth Biplane. The park also has an original HF—24 aircraft on display.

The Children Science Park is full of such interesting exhibits. For small children, there are pet animals like rabbits, guineapigs, parrots and pigeons. They can also observe the behaviour of multi-coloured fishes in the aquarium.

The Children Science Park is an unique place for the young and the old, to spend sometime on a casual visit amidst nature, or to spend the whole day for an intensive study of science.

Aeroplane, steam lorry, steam engine, electric generators, horse drawn tram car—historic artifacts preserved in NSC for the posterity.



Other Additions & alterations

While addition, alteration and renovation of individual exhibits took place in most of the galleries as a normal activity, following new exhibits were added to the different museums during 1979-80 :

At BITM, Calcutta

1) 'Psychological Paradox' in Popular Science Gallery
2) 'Picture Phone' in Communication Gallery
3) 'Douglus Motor Cycle' in Transport Gallery
4) 'First Oil Well in India' in Petroleum Gallery
5) 'Stress Pattern' in Popular Science Gallery

At NSC, Bombay

1) Hologram—which produces a coloured 3-D figure when illuminated by white light
2) Interference pattern produced by finely etched metal plate
3) Illusion of converging spiral when a disc is rotated.
4) Production of colour by a rotating disc on which black and white patterns have been drawn.

At VITM, Bangalore

1) Electronic Desk Calculator
2) Cross-Bar Telephone Exchange

At SSC, Patna

1) Earth Globe
2) Wind-mill
3) Body moves up-hills
4) Loop the loop
5) Sea-Saw set
6) Musical Bars
7) Camera Obscura
8) Cycloid Path

VISVESVARAYA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Motive Power Gallery :

The Motive Power gallery begin with an animated display to initiate the visitor into the various sources of motive power. The diorama on "Persian Wheel" depicting the use of bullocks to lift water from wells for irrigational purposes, diorama of a simple man power machine, important models of windmills, models of historic steam engines, two original antique steam engines, water turbines, blades of a modern steam turbine, gas engine, models of petrol engine, diesel engine, automobile diesel engine, radial aircraft engine, and an Avon jet engine manufactured by Rolls Royce are some of the important exhibits.

Electrotechnic :

As electricity plays an important role in our daily life the museum designed its first gallery on "Electrotechnic". The gallery is divided into 3 different sections. The first section deals with the principles of electricity and magnetism. The second section deals with telephony and the third section deals with the modern application of electronics in industries. Models relating to development of electricity, important experiments on the measurement of electrical energy, discharge of electricity through gases, function of telephone, remote-controlled boat, uses of photo-electric cell and a tomorrow's room of electronics can be seen in this gallery.

Popular Science :

A study of popular science creates scientific temper which is the prime need of the day. Measurement section shows the early concepts of measurement, through interesting exhibits. The story of mathematics is told in the section on Mathematics. The section on Optics explains the function of our eye, characteristics of light, invisible radiation, use of lens etc. The section on Atomics explains the story of atom with suitable exhibits. Today we use every possible modern method of postal transports. Our ancestors devised various methods for long distance communication such as 'Semaphore Tower'. To day we use telegraphy, wireless transmission etc. An outline of these methods is told with the help of dioramas in the Communication Section of the gallery.

Timber and Paper :

The gallery presents areas concerned with Timber and Paper, through a composite type of display. The gallery is depicting the forest wealth, tree felling, seasoning and other operations and processes involved in the manufacture of forest produces, from wood to finished goods. The gallery also shows wood working implements and machinery, the history and development of paper and manufacturing processes of paper in a lucid manner.

Metals in Civilization :

The metals in civilization tells the story of different metals which contributed to the growth of technology and hence the society. The metallurgy of Copper, Iron & Steel, Gold, and Aluminium are vividly conveyed through a multifarious system of presentation. A diorama of a mint of ancient India is one of the interesting exhibits in this gallery.

NEHRU SCIENCE CENTRE

Light and Sight :

The exhibition has been divided in 10 sections: Eye — a gateway to perception ; Micro and Macro ; Reflection, Refraction ; World of Colours ; Fun with Light ; Light has a big family ; Light more light ; An Old Studio ; Captive Light, and Light and Motion. Through 220 exhibits, most of which are participatory, an attempt has been made to initiate a common man to the fantastic world of light and vision. There are also two interesting exhibits—Banya Bapu and Muto scope. Banya Bapu shows how by a deft projection of a film on 3-D Statue an illusion of a talking head can be created. Mutoscope is an old device which mimics a movie by successive super imposition of photographs.

BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Transport :

The story, how by continued endeavour through the ages man has now achived such success in land, air and water transport is the theme of the gallery. The large number of exhibits in the gallery are depicted in logical arrays in three large halls. The gallery begins with a display of a model of Mohenjo-daro Cart used in protohistoric India. The 18th Century Calcutta Transport have also been depicted by a diorama. There are models arranged in chronological order describing the gradual development of the railroad vehicles, locomotives, aircrafts, ships etc. There are many working models of historical importance relating to the development of automobiles. Two narrow-gauge locomotives and two rare vintage cars are also on display.

Nuclear Physics :

An effort has been made in this gallery to portray in a simple manner how the colossal energy obtained from atom can be put to use for human progress and welfare. An animated model of a carbon atom conveys to the visitor the idea of the structure of an atom. The principles of atomic fission and chain reaction have been explained by the help of a large panel. Intensity of radio activity in different radioactive minerals is also demonstrated. There are also models of different types of atomic reactors and power stations.

Motive Power :

With the help of a number of dioramas, exhibits and original objects arranged in two halls, the Motive Power Gallery seeks to convey to visitors a connected and systematic history of the development of power since the earliest times. Models and dioramas on muscle power, animal power, and the power from wind and water are on view. There are models on early steam engines, oil engines, steam turbines, boilers etc. The development of hydro-electricity has been traced by a number of working models. Some interesting exhibits are the transmission of power by means of belts, friction gears, links and toothed gears.

Popular Science Gallery :

Popular Science Gallery seeks to show something about scientific developments in a simple manner. It puts on display exhibits on such fundamental disciplines of science as mechanics, electricity, electronics, optics and sound. For the common man a round through the Popular Science Gallery will prove to be an exciting, delightful and educative experience. In the section of Mechanics there are models on Transfer of Momentum; Pulley System ; Centrifugal and Centripetal Forces etc. There are number of exhibits which deal with the science of electronics. Early Gramaphones and Recording Machines are great attractions of this gallery. Most of the exhibits in this gallery are of participatory type. Models on the nature of light, laws of reflection and refraction, common defects of vision, function of our eyes etc. are also on display. The Electronic Room Automatic Water Tap, Transmission of sound through Light, Stroboscope etc. are highly interesting exhibits of the gallery.

Mining :

In this gallery stress has been laid on coal mining because it is a major industry in India. The process of gradual formation of coal is shown with the help of a slide projector. Various aspects of mining technology, with special emphasis on coal, are portrayed by a series of static and working models, posters, dioramas and illustrations. Surface layout arrangements of a pit top, pumping, support, ventilation and transport are shown by means of models. The development in the techniques of breaking of ore, to the present-day sophisticated machines has been shown with the help of models. The chief attraction in the gallery is a life-size model of a driller drilling a shot hole in a coal face.

Copper :

This gallery puts on view the various processes leading to the manufacture of finished copper and brass products from the pristine ore as found in nature and also the uses of copper and its alloys. Ore samples from various parts of the world are on view. A relief map shows the copper deposits in our country. There are models explaining the mining operations, roasting of copper by furnace and electrolytic method of purification of copper. The most interesting exhibit in the gallery is the diorama of Brass Rolling Mill.

Iron & Steel :

A large map of India shows the sources of three important raw materials required for making pig iron and also indicates the places where steel is manufactured. A large scale-model of a Blast Furnace Plant shows the details of iron-making. The process of steel manufacture is explained by an accurate scale-model of an Open Hearth Furnace, in this gallery. Two complete models of Rolling mills and a diorama are there for the visitors to see and form an idea of how steel is shaped. A large layout model of a modern steel plant is a prize exhibit of this gallery.

Petroleum :

The gallery begins with description of the origin of oil and puts on view three different models of earth's strata which favour oil accumulation. A working model demonstrates the seismic survey of oil. Various drilling tools and a full size replica of a giant travelling block are on view. The diorama of an oil field gives an idea of the enormous number of drilling required for tapping oil from oil-rich regions.

Electricity :

The exhibits in Electricity Gallery are so arranged as to trace the gradual development of static and current electricity. Exhibits like Electrophorus, Voss machine, Van-de-Graaf Generator etc. explain the generation of static electricity. Historic experiments done by famous scientists are shown by a series of working exhibits which demonstrate the magnetic properties of electric current, induction, generation of electricity and similar other phenomena. A replica of Siemen's first D. C. Dynamo, old and antique motors, generators, converters, transformers and energy meters are also on display.

Electronics & Television :

In this gallery an attempt has been made to show some of the applications of electronics in industry and to explain its basic principles. There is on display a rare collection of different types of valves and appliances for various electronic apparatus. A few working exhibits explain the principles of transistor and valve operated radio. Industrial applications of electronics has been shown by some interesting working models. A very valuable exhibit in this gallery is a replica of the historic apparatus devised and used by Sir J. C. Bose for studying reflection, refraction and polarization of micro-waves.

The biggest attraction of this gallery is a modern Television Studio where the visitor can take part as a performer by the help of a closed circuit T V. A visitor can observe the operation of Television Cameras and the control unit in this gallery.

Communication :

The gallery on Communication traces the historical development of the postal system, telegraphy and telephony. Models on postal system begining from the pigeon post and the human mail runner to present-day mail train and night air mail service and rocketgrams are on display. There are also a model of the Morse Telegraph System of 1935, different types of Morse Printers, Signalling Apparatus etc. A sample of the first underground telegraph cable laid between Diamond Harbour and Calcutta in 1951 is a rare collection of this gallery. A collection of telephone instruments shows magneto instruments, central gallery and automatic telephones of the 19th and 20th Centuries. Some of the interesting exhibits are Crossbar Exchange, Hear your own voice through a telephone, Picture phone etc.

Solar Energy :

In the wake of the impending crisis in the Energy front there is a great necessity to make the mass aware of the various alternatives to the conventional energy sources. With this aim in view the BITM contemplated to develop a new museum section on the topic. An exhibition of semi-temporary nature was planned and developed on the theme 'Solar Energy—its potentialty for future use', and has been temporarily shown in the museum. It had due coverage on (i) concepts in different mythologies where Sun was regarded as an 'Energy God'. (ii) primitive attempts to harness the power of the sun for different utilities. (iii) some successful ventures with solar power in the early days. (iv) present thoughts and experiments with Solar cells, Solar cookers, Solar dryers & refrigerator, Solar-powered transport etc. through a set of models and exhibit.

This, of course, is not an exhaustive treatment but an introduction to the topic with enough scope to develop further.

SRIKRISHNA SCIENCE CENTRE, PATNA

Science For All :

An exhibition consisting of working exhibits on Water, Science of Motion and Popular Science is on view. There are about 80 models and exhibits in the exhibition.

Shrikrishna Singh Memorial Room :

A photographic display on Dr. Shrikrishna Singh, presenting the life sketch of the first Chief Minister of Bihar along with his bust portrait, is on view.

DISTRICT SCIENCE CENTRE, PURULIA

Science & Industries :

Twenty four simple working exhibits on interesting problems of mathematics are on view. A series of exhibits show how the Pythagorean theorem can be proved with the help of liquid, meanings of different formulae in Algebra, application of Trigonometry, basic idea of a Computor, advantage of binary system etc.

Besides, some popular exhibits like Electronics Room, Burglar's Alarm, Automatic Water Tap, Magic Lamp etc. are on display. Samples of important minerals available in Purulia district and their utilization have been shown with the help of photographs, charts etc. There is a large panel showing the manufacturing process and utilization of Lac, which is a local industry of Purulia.

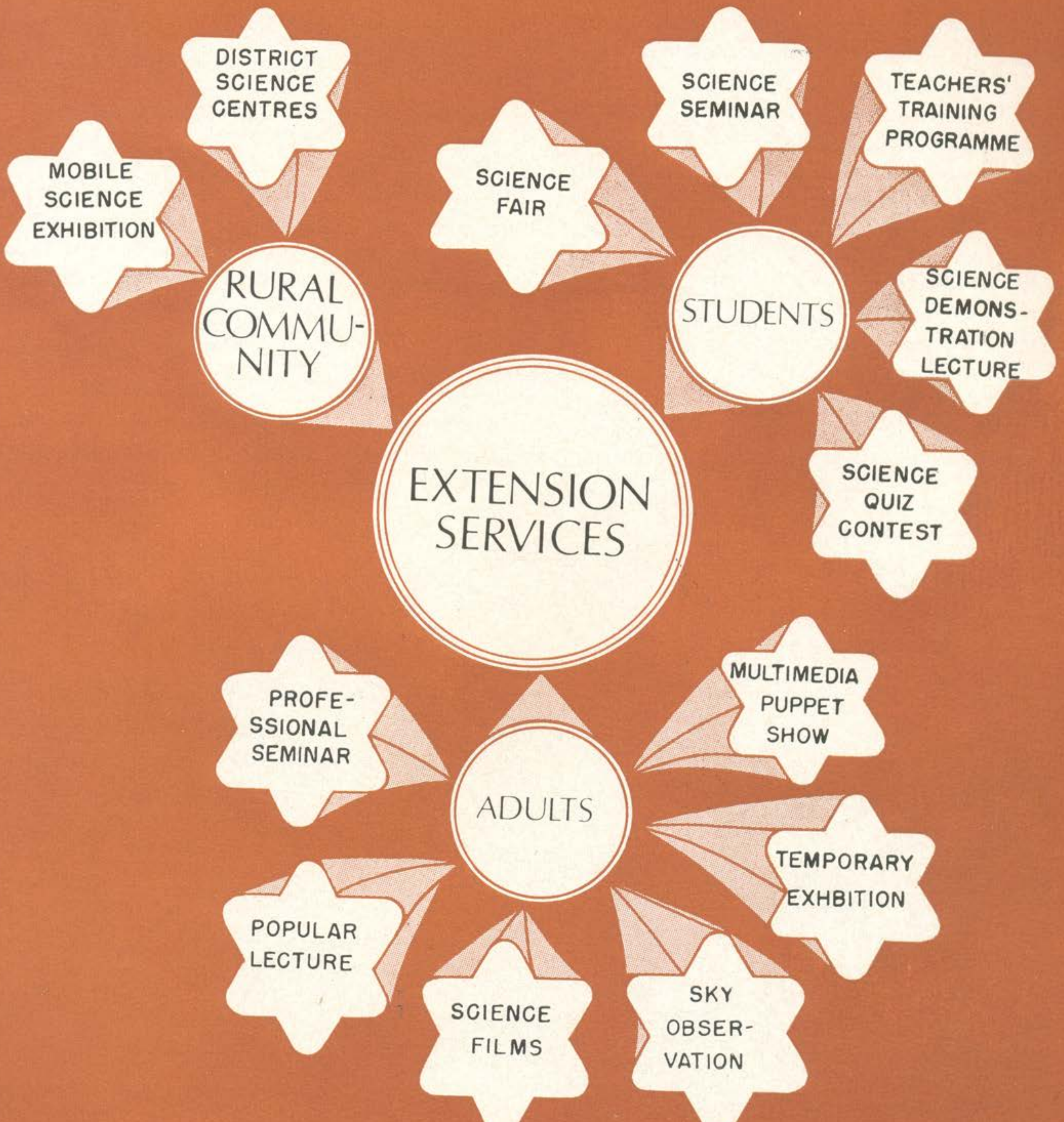
DISTRICT SCIENCE CENTRE, MALDA

Popular Science

Twenty four working exhibits on earth where we live are on view. The exhibits relate to the origin of earth, its surface, inside level, geographical phenomena, change of season, latitude and longitude, moon and artificial satellites, solar and lunar eclipse. Besides, there is a section on jute and jute products. Samples of furnishing and other fabrics, utilization of waste materials such as sticks for the manufacture of insulation board, paper pulp, rayon blended fabric and union fabric are on display.

DISTRICT SCIENCE CENTRE, GULBARGA

The District Science Centre at Gulbarga, Caters to the needs of the students and general public in and around Gulbarga. Periodically the exhibits on display are replaced by another set of exhibits on a different theme, each set normally consisting of 24 participatory exhibits. The topics hitherto covered include Water-the Fountain of Life, Man Must Measure, The Planet we Live in, Popular Science etc.


EXTENSION SERVICES
RURAL COMMUNITY
MOBILE SCIENCE EXHIBITION
DISTRICT SCIENCE CENTRES
SCIENCE FAIR
STUDENTS
SCIENCE SEMINAR
TEACHERS' TRAINING PROGRAMME
SCIENCE DEMONSTRATION LECTURE
SCIENCE QUIZ CONTEST
ADULTS
PROFESSIONAL SEMINAR
MULTIMEDIA PUPPET SHOW
TEMPORARY EXHBITION
POPULAR LECTURE
SCIENCE FILMS
SKY OBSERVATION

NCSM museums/centres are organising different kinds of school programmes, rural programmes and programmes suitable for adults on regular and occasional basis to cater to the needs of three different target groups. The Mobile Science Exhibition Units on various themes have great relevance to the rural community. The District Science Centres are catering to the needs of the people of the concerned districts and their neighbourhood through the same range of activities like the parent museums. To stimulate ingenuity and encourage experimentation amongst students science fairs/camps are organised every year in NCSM museums/ centres. Besides, Science Seminars, Lecture Contest, Quiz Contest, Essay competition etc. are specially organised for the school and college students who form a vast portion of our population. The another target group is the adult community for whom professional seminars, popular lectures, scientific film shows, temporary exhibitions and multi-media programmes are held in NCSM museums/centres. The aim of all such programmes is cater to the requirements of as wide a spectrum of audience as possible.

RURAL COMMUNITY

Mobile Science Exhibition (MSE)

Mobile Science Exhibition is specially designed to deliver the message of science at the door of the rural community. The present exposure-oriented exhibition units of 24 or 28 working exhibits are on themes which have great relevance to the life of common man. The exhibits are mounted on a specially designed museobus and the exhibitions are held for

3 to 5 days at each site according to a pre-schedule programme. The following themes have so far been developed for the Mobile Science Exhibition.

1) Transformation of Energy
2) Light & Sight
3) Science of Motion
4) Popular Science – 2 units
5) The Planet we live in
6) Water the Fountain of Life
7) Man Must Measure
8) Agriculture (developed in 1979-80)

During 1979-80 the Mobile Science Exhibition units toured 7 States – Karnataka and Tamil Nadu in the South, Maharastra and Gujrat in the West, and Assam, Orissa & West Bengal in the East. Pertinent figures about the MSE performance are as follows :

Number of units operated—5
Number of States covered—7
Number of exhibitions held – 289
Total No. of visitors – 6,51,463

Shri Kamal Guha, Minister of Agriculture, Government of West Bengal inaugurating the new Mobile Science Exhibition Unit on Agriculture commissioned by BITM.

The unit on Agriculture is the latest addition to the fleet of MSE. This was planned, designed and fabricated at BITM, Calcutta under advice from the State Govt. Agricultural Department, Krishi Viswa Vidyalaya and other relevant organisations. This unit comprising of 24 exhibits was inaugurated in July 1979 at West Bengal.

District Science Centre

At present there are three experimental District Science Centers — Gulbarga in Karnataka functioning under the VITM, Bangalore, and Purulia and Malda in West Bengal functioning under the BITM, Calcutta. These Centres cater to the needs of the people of the concerned districts and also their neighbourhood through same range of activities like their parent bodies viz. exhibition hall, hobby centres, science demonstration lectures, technical film shows, science fairs/seminars etc.

During the period under review the following were the visitor figures of different District Science Centres.

Centres	*Visitors at DSC*	*Visitors at Film Show organised by D. S. C.*
Gulbarga	20,084	26,340
Purulia	8,811	18,247
Malda	7,459	7,309

STUDENTS

Science Fair/Camp

To stimulate ingenuity and encourage experimentation towards purposeful innovation, science fairs/camps in collaboration with concerned State Education Departments are being organised every year. The Fair/Camp is a platform for the presentation of material evidence of creativity in students and is both competitive and co-operative in character. These are held initially in various districts culminating in the Annual Science Fair/Camp conducted in the main Museum. Scholarships, prizes and trophies are awarded to the successful competitors.

In SSC, Patna, State Level Science Exhibition for school students was organised in collaboration with the State Institute of Science Education, Govt. of Bihar from November 21-24, 1979. 206 students participated in the exhibition with 177 models and exhibits prepared by them. The exhibition drew 23,945 visitors including 3,446 students and teachers. The exhibition was inaugurated by Dr. A. R. Kidwai.

Governor of Bihar on November 21, 1979.

During the period under review seven Zonal Level Fairs were conducted by VITM to give a wider coverage. These were attended by 490 students from 245 schools presenting 735 exhibits.

The Regional Science Fairs for the students of higher secondary Institutions and members of Science Clubs were organised by BITM. In all 328 students participated from 55 schools/clubs with 179 models and exhibits.

This year VITM added a new dimension to the annual science fair. Instead of organising usual State Level Science Fair, a Southern India Science Fair was organised from February 15 to 19, 1980 with the active participation of neighbouring states. 63 schools from Tamil Nadu and 33 schools from Andhra Pradesh participated in the fair, apart from 128 schools from the home state of Karnataka. A total of 500 exhibits were displayed by 454 students from 227 schools.

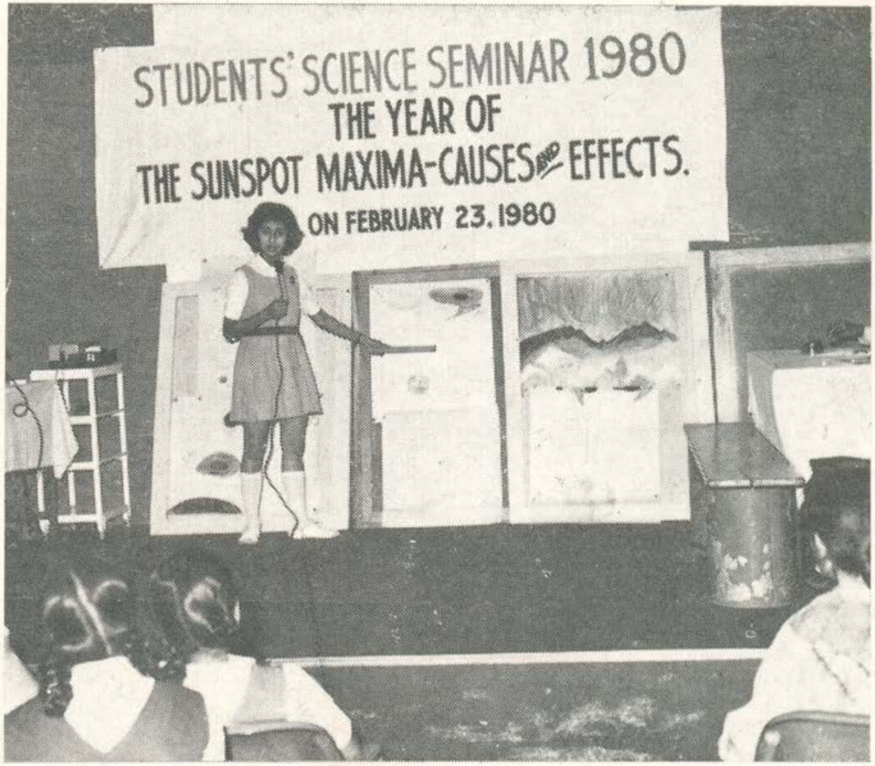
Science Fair provides the opportunity to children for exhibiting their creative talent.

Demonstration - cum - Training Programme on different trades were conducted with a view to enlarge the ingenuity of the young participants towards industrial orientation.

These were :—

(1) Wood turning (2) Bakery products (3) Mechanical component making (4) Tailoring (5) Chalk making (6) Preparation of Jam and Jellies (7) Screen printing and (8) Clay modelling.

This programme was arranged with the collaboration of Regional Design & Technical Development Centre, Bangalore ; Pilot Bakery Dept., University of Agricultural Sciences, Bangalore ; Dynam Engineering Corporation, Bangalore and Canning Centre, Bangalore.


STUDENTS' SCIENCE SEMINAR 1980
THE YEAR OF
THE SUNSPOT MAXIMA-CAUSES & EFFECTS.
ON FEBRUARY 23, 1980

Competitive Science Seminars on topics of current interest is held in all NCSM Units.

Students' Science Seminar :

As a part of the programme for International Year of the Child BITM in collaboration with the Department of Youth Services, Govt. of West Bengal and Nehru Yuvak Kendra, Govt of India, organised a Science Seminar in West Bengal on the topic—'Science a Boon or a Curse for Children'. Statistics of Block and District Science Seminars held in West Bengal :

	Name of Seminars	No. of Student Competitors	No. of audience
Block	120	1,009	39,276
District	16	488	7,125

Seven State Level Science Seminars on the same subject were organised in the following 7 States :

(1) Assam (2) Bihar (3) Manipur (4) Mizoram (5) Nagaland (6) Orissa and (7) West Bengal. These were arranged with the respective State Govts.

State Level Science Seminar for school students :

Subject : 'Science—a Boon or a Curse for Children'

Date : September 1, 1979 ;

No. of participants : 13

No. of Visitors : 553 students and teachers. The seminar was organised in collaboration with the State Institute of Science Education, Govt of Bihar.

NSC, Bombay organised a Students' Science Seminar on the topic which was of current scientific significance "Year of Sunspot Maxima—causes and effects" in the Centre. 52 student participants were registered. After a preliminary contest on February 14 and 15, 1980, 33 students qualified for the final which was held on February 23, 1980. The students came from higher secondary schools of Bombay and they were allowed to use the library of the Centre. The students made a fine attempt to this topic by using charts, slides and other types of visuals prepared by themselves.

VITM, Bangalore conducted a seminar on "Artificial Rain—can it result in uniform distribution" for school students on 10.9.79. This keenly participated Seminar was attended by 40 students from Bangalore. Besides, 20 College students attended the seminar on 'Skylab—its beginning and end' conducted by VITM, Bangalore on 22.9.79.

Lecture Contest :

A state level lecture contest on "Influence of Electric Illumination on Society and Industry" was organized by VITM, Bangalore for engineering students on 31.11.79 in connection with the exhibition on Centennial of Electric Illumination. This programme was attended by 25 students from Engineering Colleges in different parts of the State. The first six in the merit list have been awarded prizes donated by Philips (India), Bombay.

Science Quiz Contest, oral and written are held on Museum exhibits.

Essay Competition :

An essay competition was arranged by VITM, Bangalore, for school and college students on "Impact of Electric Illumination on Society" on 10.10.79. In all 30 students participated in this competition. The essays were examined by outside experts separately for school and college sections, and the best three in each group were awarded prizes donated by some of the industries.

Science Quiz Contest :

Science Quiz Competitions are held for school students to enthuse them to associate the relevance of the gallery exhibits with the school curriculum ; it also helps in increasing their level of knowledge in science and technology through fun. The contests are held on a knockout basis and the winning students are awarded attractive prizes. During the period under review BITM, Calcutta organized 7 quiz contests where 52 school students from 18 schools participated. In VITM, Bangalore, 102 students attended the quiz contest from different schools in Bangalore. In NSC, Bombay, 92 schools were registered for the quiz contest. In NSC, Bombay a written contest on science quiz was also held on October 15, 1979 to commemorate the 2nd Anniversary of the Light & Sight Gallery of the Centre. The questions were asked on general knowledge in Science & Technology, Curricular Science and Mathematics (upto 10th standard) and on the exhibits of Light & Sight Gallery. This is the first time NSC, Bombay conducted a written Science Quiz Contest on the Mobile Unit—"Man Must Measure" to study the Mobile Exhibition at ONGC High School, Baroda in November, 1979. 76 students from 11 schools participated and prizes were awarded to 12 students by NSC, Bombay and ONGC High School, Baroda, jointly.

ADULTS

Professional Seminar

Seminar on 'Developments in Navigational Signalling Techniques'

Experts from the Department of Lighthouse & Lightships, R & D units of M/s. Chloride India Ltd., Calcutta Port Trust, Shipping Companies and Equipment Manufacturers spoke on various technological developments that took place in navigational signalling aids in and outside India. Shri K. R. Bose, Director General, Department of Lighthouses & Lightships, Ministry of Shipping & Transport, Govt. of India, inaugurated the seminar. Particulars of the Seminar organised by the BITM, Calcutta, in connection with the celebration of the 20th Anniversary of its opening are as follows :

1. Radio Aids to Navigation—
Shri B. S. Srivathsan, Dy. Director General (E), Dept. of Lighthouses & Lightships, Calcutta.

2. Civil Engineering Aspects of Lighthouse Construction—
Shri N. R. Gopalswamy, Dy. Director General (C), Dept. of Lighthouses & Lightships, Calcutta.

3. Use of Solar Energy in Navigational Signalling Aids—
Dr. H. Saha, Scientist, R & D Unit, Chloride India Ltd., Calcutta.

4. Role of Navigational Aids—
Capt. S. C. Bagai, Addl. Supdt., Dredger and Despatch Service, Calcutta Port Trust.

5. The Signalling Techniques and Navigators—
Capt. V. P. Sharma, Marine-Supdt., Scindia Steam Navigation Co. Ltd., Calcutta.

6. Laser Beam as a Navigational Aid—
Dr. K. K. Bandyopadhyay, Hydraulics Study Dept, Calcutta Port Trust.

7. Accurate Sector Navigational Lights—
Shri R. Malhotra, M/s. Stone Platt Electrical (India) Ltd., Calcutta.

Shri Govind Narayan, Governor, Karnataka inaugurating the Workshop on the Establishment of Science Museums in Asian Countries—Training and Exchange, held in VITM, Bangalore in February, 1980.

Dr. Grace Morley, Permanent Adviser, International Council of Museums receiving a token presentation from the oldest employee of VITM, Bangalore.

UNESCO Workshop

A Workshop on "The Establishment of Science Museums in Asian Countries : Training & Exchange" was held at VITM, Bangalore from February 11-18, 1980. This Workshop was jointly sponsored by the United Nations Educational, Scientific and Cultural Organisation (UNESCO), National Council of Science Museums (NCSM), ICOM Regional Agency in Asia and Indian National Committee for ICOM. 35 participants from India and abroad participated in the Workshop. The countries represented include Australia, Philippines, Thailand, Republic of Korea Pakistan, Sri Lanka Nepal, USSR, USA, Federal Republic of Germany, and representatives from UNESCO Paris, Djakarta and New Delhi, and representatives from the ICOM Regional Agency in Asia and the Indian National Committee for ICOM. This Workshop reviewed the actions of earlier International Meeting of Experts at Manila in December 1978 which discussed the principal criteria to be used in the planning of science and technology museums in developing countries. The Workshop was divided to seven different sessions. The participants discussed in detail the various aspects of museological and museographical thematic presentation, scientific information, training in visual presentations, training in exhibit preparation, exchange of objects and exhibition etc. An useful Working Document was also prepared as an outcome of the Workshop.

Popular Lectures :

Popular Lectures are arranged by museums/centres for students and general public on recent advances in science and technology of socio-economic relevance. During the period, BITM, Calcutta, arranged 8 lectures delivered by eminent scientists/experts in BITM, Calcutta. Such lectures are normally arranged in the evening so that interested persons of various walks of life can attend the lecture programme. A large number of students and general public attended the lectures.

1. Indian Snakes
Shri Dipak Mitra, April 18 '79
Calcutta Snake Park.

2. Experience in Lighthouses
Shri S Barnabas, May 4 '79
Keeper, Lighthouse,
Mahabalipuram.

3. Experience in Lighthouses
Shri S N Ebrahim, May 8 '79
Ex-Lighting Officer,
Calcutta Port Trust.

4. Experience in Lighthouses
Shri E C Nair, May 10 '79
Asstt. Engineer,
Lighthouse Deptt. ,
Calcutta.

5. Einstein-His Life & Works
Shri Sankar May 11 '79
Chakraborty,
Science Writer

6. Experience in Lighthouses
Shri D S Packiam, May 14 '79
Keeper, Lighthouse,
Madras.

7. Einstein-His Life & Works
Shri Sankar May 15 '79
Chakraborty ,
Science Writer.

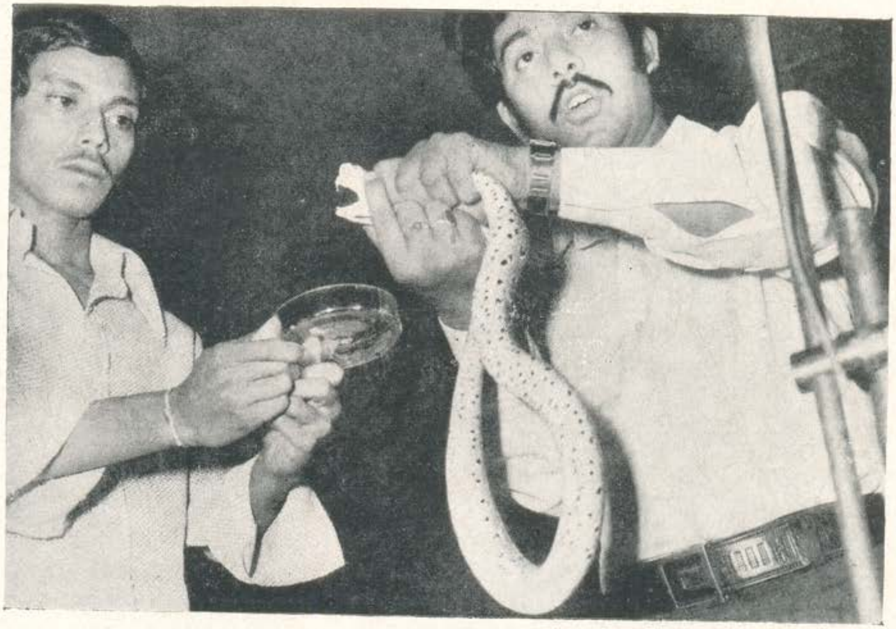
8. Indian Birds
Shri Ajoy Home, May 27 '79
Ornithologist.

Scientific Film Shows :

Film shows on different areas of science and technology are arranged regularly in the museum auditorium of BITM, VITM, NSC, and SSC. Besides, such film shows are also arranged in the District Science Centres and Science Parks, and through Mobile Science Exhibition Units. Over and above, Science Film Festivals are also arranged periodically in museums/centres for the benefit of school students.

No. of shows in MSE & DSC.	No. of visitors
BITM—521	1,63,034
VITM—313	1,07,590
NSC—233	69,835

A Popular Lecture on Snakes and superstitions held in BITM—a series of such popular lectures were held in fighting superstitions.



No. of shows in Museum Auditorium	No of visitors
BITM 268	30,360
VITM 669	46,875
NSC Three Film Festivals	23,907
SSC 273	27,321

Sky Observation Programme :

Astronomy has been a popular subject of study over the past thousands of years. The present day astronomy has assimilated all the latest development of science & technology. To popularise the study of astronomy and to provide both education and entertainment the units of NCSM are organising Sky Observation Programme for students and general public. The programme is held twice in a week at NSC, Bombay by using two Refracting Telescopes. The Sky Observation Programme is also arranged once in every week at SSC, Patna by a 3 ' Refracting Telescope. 25 such programme were arranged to observe the planets and the moon. About 1,470 visitors attended the programmes.

A total Solar Eclipse occured over a wide region of India on February 16, 1980. To create scientific awareness and to remove superstitions from the minds of the people a special programme was arranged at NSC, Bombay to observe the effects of partial eclipse through a telescope. Around 200 people watched the projection of Sun's image through the telescope. On this occasion a demonstration on 'Solar Eclipse' was also organized by NSC, Bombay which was telecast by the local Television Centre on February, 15,1980.

At VITM, Bangalore, the eclipse was telecast through closed circuit television which was witnessed by about 100 people including the UNESCO Workshop participants.

Temporary Exhibition :

One of the important areas of activities of NCSM Science Museums/Centres is to organize and hold temporary exhibitions on Science, Technology and Industry. A few exhibitions were also taken to some metropolitan cities of India by the NCSM. In many cases NCSM received active collaboration from educational institutions, technological institutes, research organisations, government departments and industries. During the year under review NCSM organised the following exhibitions :—

New Technology for Growth (April 8 to 11,1979)

The exhibition and get-together was sponsored by the State Level Research and Development Committee, West Bengal in collaboration with National Research Devment Corporation (NRDC) and National Council of Science Museums (NCSM) in the 'Technology Centre' of the BITM, Calcutta. The BITM actively collaborated in organising the said exhibition and get-together by providing space and all infrastructural facilities. The exhibition and get-together were aimed at highlighting the activities of national laboratories for the benefit of the industries, particularly for the small and medium scaled. The exhibition was inaugurated by Dr. P. C. Chunder, Minister for Education & Social Welfare, Govt of India, on April 8, 1979. 86 Scientists from different national laboratories joined the programme and 128 industries participated in the get-together.

Exhibition on 'Einstein—His Life and Works' (April 22 to May 5, 1979.)

The special exhibition, prepared by BITM was held at SSC, Patna in collaboration with the Albert Einstein Centenary Celebration Committee, Patna. 3,601 visitors, mostly students, visited the exhibition.

Shri Chand Ram, the then Minister of Shipping and Transport inaugurating the exhibition on World of Light Houses in BITM, Calcutta.

Dr. Yash Pal, Chairman, NCSM examining the exhibition on Einstein held in NSC, Bombay.

Shri M. Hidayatullah, Vice-President of India and Dr. Karan Singh, the then President, NCSM and Dr. D. S Kothari, eminent Scientist visiting the exhibition on Einstein in Delhi.

This exhibition was also held at the National Museum, New Delhi on September 13 to November 7, 1979 in collaboration with the National Museum. The exhibition was inaugurated by the Secretary, Ministry of Education & Social Welfare, Govt. of India. About 20,000 people, mostly students, visited the exhibition.

After successful exhibition in Calcutta, Patna and New Delhi, this exhibition was sent to NSC, Bombay for the people of western India to witness from 15 to 17 January, 1980. Dr. Yash Pal, Director, Space Application Research Centre inaugurated the exhibition. It attracted 22,727 visitors from all walks of life.

The World of Lighthouse (May 2 to 31, 1979)

To commemorate the Golden Jubilee of the Lighthouse Services in India, BITM in collaboration with the Department of Lighthouses and Lightships, Ministry of Shipping & Transport Govt. of India, organized an exhibition. 'The World of Lighthouses'. The exhibition displayed quite a many original and old lighthouse equipments, many Indian products (which are import substitutes), three dimensional animated demonstration exhibits, dioramas, sectional models, painted murals, charts etc. The term 'Lighthouse' in the modern sense includes all aids to navigation including variety of lights, sounds, radio beacons, radar, responder beacons, hyperbolic systems of radio navigation, sub-marine signals, buoys, light vessels etc.

The exhibition, which was known to be first of its kind ever held anywhere to unravel the secrets of lighthouse world, depicted clearly the gradual systematic development of lighthouses and other aids to navigation from primitive stage to the present modern sophistication. The exhibition also focussed attention on the unknown world of lighthouse and provided a better understanding and knowledge of their salient services. The exhibition attracted 30,234 visitors.

BITM Completes 20 years (May 2 to 31, 1979)

A photographic exhibition entitled 'Birla Industrial & Technological Museum completes 20 years was arranged to highlight some of the important events and activities of the museum during the last 20 years. Publications on various galleries and educational activities of the museum were also displayed to draw public attention.

Technology at Home (June 7 to 17, 1979)

An exhibition entitled ' Technology at Home" was inaugurated in VITM, Bangalore on 7th June, 1979 by Shri A. Bose, the former Director, National Council of Science Museums, India. The aim of this exhibition was to appraise the average housewife about the significant role that technology has been playing in reducing the strain and complexity of the domestic routine and to make them aware of the latest developments in home technology so that they may utilise these developments by minimising the drudgery of the domestic works and make it a pleasant occupation. The exhibition portrayed many areas of housekeeping such as, cleaning and dusting, ventillation, heating, cooking vessels, stitching and embroidery, measurements etc. The effectiveness of the modern technology in remedying unfortunate physical handicaps was a special feature of the exhibition. The exhibition was assisted by the participation of 30 industrial firms and dealers. 29,100 visitors went through the exhibition.

Social Communication in Britain (August 24 to Sept. 13, 1979)

The BITM in collaboration with the British Council Division, Calcutta, organised the above exhibition in the Museum premises. Communication refers to the special process which makes interaction with mankind possible and enables man to be a social being. The exhibition demonstrated through written words, pictures, drawings, paintings, diagrams, charts etc, the communication of ideas and information which are of direct public benefits. The exhibition attracted 13,846 visitors.

Electric Illumination (Sept. 15 to Dec. 31, 1979)

To commemorate the centenary of the invention of incandescent lamp by Thomas Alva Edison, an exhibition on 'Electric Illumination' was organised by the VITM, Bangalore. Shri Ravi Kirloskar, Chairman and Managing Director of Kirloskar Electric Co., Bangalore inaugurated the exhibition on 15th September, 1979. This exhibition was planned to make people aware of the impact of electric illumination on society. History of illumination—from the discovery of fire by ancient man to the invention of incandescent lamp by Edison–, lamp industry in India and its growth, the science of illumination, the art of illumination, street lighting, the rural electrification etc. were the main aspects of the exhibition. Seven major electrical industries extended their active collaboration with the VITM. First-Day covers and stickers were also brought out by the museum to publicise the event.

The Age of Shakespeare (Nov. 8 to 28, 1979)

The BITM, Calcutta, in collaboration with the British Council Division, Calcutta, arranged a special exhibition to depict the cultural life of England at the time of Elizabeth I and James I. The fact that writings of Shakespeare

Sri Ravi Kirloskar, Chairman & Managing Director, Kirloskar Electric Co. viewing the exhibition on the centennial of Electric Illumination in VITM, Bangalore after its inauguration by him.

A view of the exhibition on Technology at Home Presented in VITM, Bangalore.

are now performed and studied throughout the world has stimulated interest in the cultural environment in which he and his contemporaries lived and worked. Through words, pictures, drawings, paintings, diagrams etc, this exhibition depicted the literature, the science and arts of those years between 1558 and 1623. The contents of the exhibition included, among other things, the following : (a) William Shakespeare 1564-1616, (b) Town and Country, (c) Court and Crown. (d) Architecture ; Great Houses, (e) Domestic Architecture, f) Portaitures, Miniatures and Monuments, g) Decorative Arts, (h) Medicine, (i) Education, (j) Drama, (k) The Playhouse, (l) Poetry, (m) Music, (n) Science and Learning, (o) Exploration, (p) Books on Shakespeare and his age.

Participation in Science Exhibition in New Delhi (November 14-20, '79)

BITM participated in the Science Exhibition organised for children by the Jawaharlal Nehru Memorial Fund and the National Council of Educational Research & Training at Teen Murti Bhavan, New Delhi, with the following :

a) Exhibition : Einstein - His Life and Work' (1879-1955). The exhibition on Einstein covered a space of about 2000 sq. ft. and contained photographs of the famous scientist taken on important occasions in his life, charts and a few working models on his works.

b) A short photographic display of Educational Extension Activities of the NCSM Museums/Centres.

An illustrated folder (English/Hindi) on Einstein was brought out during the occasion. The exhibition drew about 30,000 visitors, mostly students. Many distinguished persons also visited the exhibition.

Vintage Car Exhibition (March 23 to April 6, 1980)

As a prelude to the setting up of a vintage car section in the proposed Transport Gallery of the NSC, Bombay, a vintage car exhibition was organised previously. A second such exhibition was organised at NSC, Bombay, to show the phenomenal develop-

A scene from the short play on Thomas Alva Edison produced by the Multi-Media cell of VITM Bangalore in connection with the exhibition on Electric Illumination.

ment of the automobiles in the past decades. In this exhibition Vintage Cars, Old Fire Engines, Miniature Car Models, Cut-Section of Jeep, and Philately on Automobiles were on display. It was attended by 13,303 visitors.

Multimedia Programmes : Skit on Thomas Alva Edison.

VITM, Bangalore has created a Multi-Media Cell in the museum with an obejective to explore the various possibilities of educating science in general to the youngsters with the help of different existing media. The first venture in this direction was a presentation of a skit on the life and works of Thomas Alva Edison. To give a comprehensive audio-visual exposure, narration, dramatics, pre-recorded tapes, projection of slides etc. were used. Museum staff played the role of architects and actors of this programme. A total of 12,375 school students witnessed 55 shows presented by the museum. Besides, three special shows were conducted at Indian Institute of science and at the museum, in connection with the Southern India Science Fair and the UNESCO Workshop.

Puppet Show :

Puppet show is an effective media to impart education in a popular manner. VITM produced a puppet show on the theme "Wheels," the first in MAN, THE INVENTOR series, presenting the history of invention of wheel by man through puppets, slide projection and pre-recorded tapes. BITM also arranged a special puppet show for children to mark the occasion of International Year of the Child. The programmes were enjoyed by a large number of children and school students.

EDUCATION AND TRAINING

NCSM helps in supplementing science education in schools in close collaboration with the various State Education Departments, Teachers' Training Colleges, Schools, Universities and various other agencies. Through such programmes school students are served with regular informal education on the basis of school curriculum. Trained guide lecturers of the respective museums/centres deliver lectures to the school groups on various topics related to the fundamentals of science specially chosen from the school curriculum, and perform series of experiments before the students for better understanding of the subject matters NCSM museums and centres have also developed a number of kits for performing experiments on subjects covered by the school curriculum.

NCSM museums/centres give training to Museology students, teachers, adults and children on specialised subjects. Different professional groups are benefited by various training programmes which are conducted in different museums/centres in such fields in which they have necessary expertise,

Science Demonstration Lecture (SDL)

Visual aids are indispensable for teaching of science in schools and colleges. Lectures delivered with the aid of demonstration equipments leave a lasting impression on the students. Such aids are not readily available in the market. Science Demonstration Lectures are meant to supplement formal science education in upper classes in the secondary school. Through the SDL, museums endeavour to impress upon the school authorities as to how teaching aids could be fabricated with low cost materials which may be readily available in the locality. The museum organize Teachers' Training Programmes so that the trained teachers can guide the students in the fabrication of such aids. During the period under review BITM, Calcutta organised 141 lectures in 86 schools covering 5 districts in West Bengal which were attended by 13,435 students and teachers. VITM, Bangalore, organized 208 such lectures in rural areas to the benefit of 81,250 students.

The following are the topics on which the lectures are delivered by the Museums :

a) Principles of Electric Generators
b) Properties of Liquids
c) Acids, Bases & Salts
d) Physical Properties of Air
e) Properties of Matter

f) Optics
g) Magnets
h) Atom
i) Heat
j) Chemical Reaction
k) Properties of Sound
l) Properties of Sight
m) Cells and Lead Accumulators

VITM, Bangalore organized a special Demonstration-cum-Lecture Programme in collaboration with SOSFIMAK (Society of Short Film Makers) on 'Importance of Light in Cinema' during the exhibition on the centennial of electric illumination. The noted Cinemotographer Shri S. Ramachandra delivered the lecture with demonstrations. 60 people attended the programme.

Telescope Making Programme in Progress at NSC, Bombay.

School Loan Service (SLS)

Under this scheme secondary schools are fed with educational exhibits, designed and fabricated by the Museum, suitable for classroom teaching through practical demonstration. The subject matters of exhibits are selected from the science topics which are taught in schools. Exhibits on various disciplines of science viz. General Physics, Heat, Optics, and Electricity have been developed with the objectives (a) to help the teachers in explaining the subjects clearly and lucidly through practical demonstrations to the students and (b) to provide ideas of fabricating scientific apparatus and equipments which forms the topic 'Work Education' in the new school syllabus. The exhibits are on table and self-contained and they can be operated very easily with the help of 'Instruction Manuals' supplied by the Museum. During the year 15 loans were effected from BITM, Calcutta.

Teachers' Training Programme (TTP)

The main idea of this programme is to provide the science teachers of high schools with short term training in handling some of the basic and important tools and also in fabrication of easy and low cost scientific models and teaching aids for their day-to-day class room teaching. After the training, the teachers are also expected to open and run Hobby Centres in their schools during their leisure hours. Such programmes are normally arranged through the Dist. Inspector of Schools, or State Institute of Education. BITM conducted Teachers' Training Programme at five places as given in the next page :

Place	No. of Teachers	No. of Schools	Period
Shrikrishna Science Centre, Patna	8	8	May 25 to June 9, 1979
BITM, Calcutta	36	36	June 4 to 16, 1979
Purulia (West Bengal)	16	16	July 12 to 24, 1979
Nagaland	22	20	July 17 to Aug. 2, 1979
Malda (West Bengal)	40	20	Nov. 22 to Dec. 5, 1979.
	122	100	

Visual Communication Programme

A two-day programme named 'Focus on Visual communication' was conducted by the VITM on 1st and 2nd March, 1980. This programme was planned for high school science teachers to give them an exposure on the preparation of low-cost visual aids for science teaching. 20 science teachers from different schools attended the programme.

Training for Museology Students

In BITM 14 Post-Graduate students of Museology (Final Year) from University of Calcutta received practical training in Museography from May 10 to 21, 1979. The training programme included following subjects : (i) Preparation of a thematic layout of a gallery on chosen subject ; (ii) Preparation of a dummy layout model showing display arrangements, visitors flow, illumination etc. (iii) Preparation of labels and graphics, (iv) Preparation of a dummy layout model for a diorama, (v) Silk screen process etc. Five Museology students belonging to varied discipines from Birla Institute of Technology & Science, Pilani, Rajasthan, received training under this Practice School Programme at VITM, Bangalore from May 24 to July 18, 1979. They worked on the project 'A proposed gallery on Sound' and submitted their report to VITM, taking into account all possible aspects of Sound which are of day to day occurances. They also conducted a survey to assess the response of the visitors to the museum, with a view to chalk out the method of approach to the gallery.

Polyvalent Adult Education Programme

A Polyvalent Adult Education Programme was organized by VITM

Students engaged in model rocket making at the Model Rocketry Camp in NSC, Bombay.

Bangalore from 18th to 22nd March, 1980. This programme was adopted with a view to give the workers in urban areas, both in organized and unorganized sectors, an exposure to the multifaceted education covering the wide and varied aspects of life. This progamme was carried out with the active collaboration of the Polyvalent Adult Education Centre, Dept. of Adult Education, Govt. of Karnataka and Ministry of Education, Govt. of India. The programme included lectures, discussions, demonstrations, practicals, films shows and visit to industries. The course was attended by 18 plumbers.

Telescope Making Programme

NCSM museum/centre conduct telescope making progamme for interested persons to familiarise stars, planets and nebulae, with the help of Newtonian Reflector Telescope. Five persons joined one such programmes held in NSC and thirteen persons participated in a programme held in BITM. The participants were taught about the grinding of glass slab, polishing and silvering of 6" diameter f/8 mirrors to be used in Newtonian telescopes for observation of planets.

Amateur Radio Activity

To develop the interest of people in the fascinating hobby of Amateur Radio, NCSM museums/centres are organizing regular classes to train students for appearing for Amateur Radio Operators' Examination conducted by the Ministry of Communication, Govt. of India. At NSC, 14 candidates were admitted for the course in October 20, 1979. 28 students were received for the next batch for 6 months course which started in November, 1979.

IVth All India Amateur Radio Convention was held at VITM, Bangalore on 12th & 13th May, 1979 with the collaboration of Amateur Radio Club, Bangalore. 245 outstation Hams and 60 local Hams participated in the Convention where technical discussions were held on Amateur Wireless Communication. In addition, Amateur Radio Stations are functioning in VITM and NSC.

Creative Ability Centre

In all NCSM Units Creative Ability Centres are giving opportunities to young children to pursue their scientific hobbies. The idea is to inculcate in students a spirit of scientific enquiry leading to experimentation and innovation and by extending guidance and work facility direct their abilities towards scientific model making. In 1979-80 BITM enrolled 20 students, SSC, Patna 31 and VITM 380. During Summer and in Winter vacations VITM organized Hobby Centre Programmes in museum premises. The programmes included various disciplines like—Electronics, Physical Sciences, Nature Study, Chemistry, Astronomy, Clay Modelling etc. Besides, outstation Hobby Centres were also conducted by VITM and BITM. Many interestting models were fabricated by the students in different museums/centres.

Model Rocketry Camp

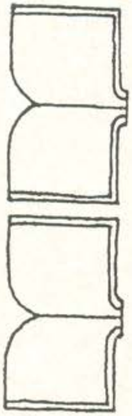
A Model Rocketry Camp for school children was held at NSC, Bombay from February 25 to 29, 1980. They were taught the basic theory of rocket flight, both single and double stage. The students also prepared paper models of rockets and fitted engines. The students learnt to measure the maximum height reached by their rockets on launching. 12 students participated in this Camp.

Technical Assistance

NCSM museums/centres rendered technical assistance to the following organizations :

a) The British Council Division, Calcutta
b) Indian Copper Corporation, Ghatshila, Bihar
c) The American Centre, Calcutta
d) Bose Institute, Calcutta

INFORMATION AND COMMUNICATION



In each of the NCSM Units there are well equipped libraries containing books and films relating to history of science, technology, graphic design, museology, art, architecture and archaeology, engineering and popular science etc. The library services are available to the staff of the museums/centres and also to the general public. The acquisition during the years and the present collection of the libraries are as follows ;

	Addition				**Total**			
	BITM	VITM	NSC	SSC	BITM	VITM	NSC	SSC
Books	1,254	639	334	850	7,980	6,822	3,291	850
Pamphlets	19		7	10	3,081		48	10
Periodicals	571	5	52	80	708	116	52	80
Technical Films	84	4	18		360	122	93	
Charts/ Maps		13	1			49	36	
Microfilms/ Microfisch						27		
Reports, Reprints, Xerox copies		317				886		

The libraries of the NCSM museums/centres rendered considerable amount of services from their Reprographic Sections. These Sections are equipped with Xerox machines and Electronic Stencil cutting machines. There are also 'micro-film reader' and 'enlarger'. Important papers of Bengal Coal Co., which are of immense value have been documented and preserved in the new archive section of BITM library.

MANAGEMENT

GENERAL INFORMATION

A. **NCSM**.

In 1978 as per the decision of Government of India an autonomous Society—National Council of Science Museums (NCSM) was formed for administering the existing Science Museums under the CSIR and for taking up the development of new Museums/Centres. At present the registered office of the Society is situated at 19A, Gurusaday Road, Calcutta-700 019.

B. **B.I.T.M**.

Location : 19A, Gurusaday Road, Calcutta-700 019 near the crossing with Syed Amir Ali Avenue.

Museums Hours : 10 a.m. to 5 p.m. Open everyday except Mondays, Doljatra and Kalipuja.

Entrance Fee : Rs. 0·50 for visitors. Free for organised students groups.

C. **N.S.C.**

Location : Dr. E. Moses Road, Worli, Bombay-400018.

Exhibition Hours : 12 noon to 7 p.m. all days except Mondays.

Entrance Fee : Rs. 0.50 for visitors, Free for organized student groups.

D. **V.I.T.M.**

Location : Kasturba Road, Bangalore-560 001.

Museum Hours : 10 a.m. to 5 p.m. All days except Mondays and notified holidays.

Entrance Fee : Rs. 0·50 for visitors. Free for organized students groups.

E. **S.S.C.**

Location : West Gandhi Maidan, Patna-800 001.

Exhibition Hours : 12 noon to 7 p.m. Open every day except Mondays and notified holidays.

F. **DSC, Purulia** :

Location : M. V. Institution, P. O. & Dist. Purulia, West Bengal.

Exhibition Hours : 12 noon to 7 p.m. Open every day except Mondays, second Saturdays and notified holidays.

G. **DSC, Malda** :

Location : Model Madrasha, P.O. & Dist. Malda, West Bengal.

Exhibition Hours : 12 noon to 7 p.m. Open everyday except Mondays, second Saturdays and notified holidays.

H. **DSC, Gulbarga** :

Location : Govt. Multipurpose High School, Gulbarga, Karnataka.

Exhibition Hours : 12 noon to 7 p.m. Open everyday except Mondays, second Saturdays and notified holidays.

Visitors' Statistics during April, '79 to March '80

	VITM	BITM	NSC	SSC
Museum/Centre Galleries	6,73,991	1,52,955*	1,07,292	1,06,256
Mobile Science Exhibitions	99,098	2,18,871	2,25,579	—
Film Shows at Museum/Centre	46,875	30,360	69,833	27,321
Film Shows at DSCs	26,340	25,556	—	—
District Science Centres	20,084	16,270	—	—
Science Fair (at Museum/Centre)	46,000	—	—	23,945
Science Fair (outside)	35,000	10,500	—	—
Temporary Exhibition at Museum/Centre	2,43,480	54,264	13,303	3,601
Science Park	—	46,428**	—	—

* The BITM, Calcutta, remained closed from 30.12.1979 to 17.3.1980.

** Visitors to Science Park at DSC, Purulia.

DISTINGUISHED VISITORS

Mr. W. L. Street
Australian Schools Commission, Canberra

Mr. Vicbai Lunsin
Director of External Relations, Bangkok

Mr. Minda C. Sutaria
Director of Elementary Education, Phillippines.

Mr. Weera Chanerongam
Institute for promotion of Teaching Science & Technology, Bangkok

Mr. Banterng Surrantragil
King Monghut's Institute of Technology, Bangkok

Prof. Teofis
Technological University, Manila, Phillippines

Mr. A. Dyankar
UNESCO, Robao

Mr. M. Bukit
Dept. of Education, Indonesia

Mr. F. Folline
Director, Ministry of Education, G.D.R.

Mr. V. Purgand
Deputy Director, State Secretariate for Vocal Education, G. D. R.

Mr. Perister
Director, Dept. of Polytechnics, G.D.R.

Mr. F. X. Mukuli
Director, Uganda Commercial Bank, Kampala, Uganda

Mr. Mohammed Jaslimuddin
Bangladesh Small & Cottage Industries Corporation, Dacca, Bangladesh

Dr. Paul Perrot
Asst. Secretary, Smithsonian Institution, Washington

Mr. Hsu Wei Shu
Associate Professor, Peking Natural History Museum, Beijing, China

Mr. S. C. Singh
Chief, Natural History Museum, Kathmandu, Nepal

Mr. F. J. Kendall
Director, Science Museum of Victoria, Melbourne, Australia

Dr. Alan Noel Baker
Senior Curator, National Museum of New Zealand, Wellington, New Zealand

Mr. Heah Soon Hook
Curator, Natural History, National Museum, Malaysia

Mr. Mohammed Akmal
Director, National Museum of Science & Technology, Lahore, Pakistan

Dr. P. H. D. H. de Silva
Director, Dept. of National Museum, Colombo, Sri Lanka

Mr. Choi Sanghoon
Director, Engg. & Maintenance Divn., National Science Museum, Republic of Korea

Miss Nitaya Suteerawut
Curator, Centre for Educational Museums, Bangkok, Thailand

Mrs. Natalia R. Pavlova
Chief Curator, Zoology Museum, Moscow

Dr. (Mrs.) Grace Morley
Permanent Adviser, ICOM Regional Agency in Asia, New Delhi

Mrs. Janine Schotsmans
Head, ICOM Regional Agency in Asia, New Delhi

Dr. M. Vannucci
Senior Programme Specialist, UNESCO, Regional Agency, New Delhi

Miss Sudha Mehndiratta
Secretary, UNESCO Regional Agency, New Delhi

Mr. A. Kholodilin
Programme Specialist, UNESCO, Paris

Mr. Allun Williams
Chairman of School Services, National Museum of Wales, Kardiff, U. K.

Mr. Peter Moses
Asst. Education Adviser, British Council Division, Madras

Dr. Velole
Ministry of Education, Belgium

Dr. P. C. Chunder
the then Union Minister for Education & Social Welfare, Govt. of India

Shri Chand Ram
the then Union Minister for Shipping & Transport, Govt of India

Shri K. R. Bose
Director-General, Dept. of Lighthouses & Lightships, Govt. of India

Shri T. N. Singh
Governor of West Bengal

Shri Jyoti Basu
Chief Minister, Govt. of West Bengal

Shri Chittabrata Mazumder
Minister, Dept. of Cottage and Small Scale Industries, Govt. of West Bengal

Mr. David Blagbrough
Regional Educational Adviser, British Council Division, Calcutta

Shri P. Sabanayagam
Secretary, Ministry of Education, Government of India

Prof. B. M. Udgaonkar
Tata Institute of Fundamental Research, Bombay

Dr. N. R. Banerji
National Museum, New Delhi

Shri Ram Niwas Mirdha
Deputy Chairman, Rajya Sabha

Prof. Sadanand Varde
Education Minister, State of Maharashtra

Dr. Abdul Latif
Chief, Asian Centre of Education Innovation

2. "Science, Museums, Rural Community and the Missing Link" by Dr. Saroj Ghose in Indian Museums Journal (under Print).
3. "Srikrishna Science Centre—a place of pilgrimage for budding scientists" published in the souvenir of all Indian Science Teachers' Association Conference.
4. "Scientific Toys—their implication in learning" presented by Shri S. R. Agarwal during the All India Science Teachers' Association conference.
5. "On the popularisation of Teaching of Western Mathematics and Astronomical Sciences in India during 18th-19th century" presented by Shri B. Chaki in the seminar on Science & Technology in 18th 19th century India, held at National Science Academy, New Delhi, from 11th-13th February 1980.

HONOURS AND AWARDS

1. Dr. Saroj Ghose, Director of NCSM, has been elected President of the Indian Association for the Extra-curricular Scientific Activities.
2. Shri N. Mitra, Senior Guide Lecturer (BITM) has been elected Assistant Secretary, All India Science Teachers' Association, a member of the executive Committee of the Association for Improvement of Mathematics Teaching, and a member of the "2nd Paribhasha Parishad" for compilation of Bengali Terminology of Mathematics.
3. Shri P. K. Palit, Senior Information Assistant (BITM) was elected Jt. Secretary of the Organization Committee of the All India Museums Conference held in Calcutta from January 17 to 19, 1980.
4. Shri S. R. Agarwal, Curator, (SSC), was opted as Chairman, Exhibition Committee by the Organizing Committee of All India Science Teachers' Association in December 1979.

SUMMARY OF EXPENDITURE

Particulars	Expenditure (in lakhs of Rs.)		
	Non-Plan	Plan	Total
CENTRAL MANAGEMENT (Head Qtrs)			
(a) Planning, Analysis, Research & Evaluation	0.86	2.44	3.30
(b) Head Quarters' technical activities Projects like District Science Centres, International & National collaborations eg. UNESCO workshop, Indo-US/Indo-USSR exhibitions etc.)	—	1.57	1.57
(c) Research Fellowships, Graduate & Trade apprentices/trainees etc.	0.29	—	0.29
(d) Staff Quarters etc.	0.08	17.25	17.33
(e) Retirement benefits (GPF/CPF, Pension etc.)	2.21	—	2.21
(f) Sundry advances	1.69	—	1.69
Total	5.13	21.26	26.39
CONSTITUENT UNITS			
(a) VITM, Bangalore	16.07	9.68	25.75
(b) NSC, Bombay	10.38	39 59	49.97
(c) BITM, Calcutta	28.96	12.04	41.00
Grand Total (Gross)	**60.54**	**82.57**	**143.11**

LIST OF SOCIETY MEMBERS OF NCSM as on 31.3.80

1. Hon'ble Shri B. Shankaranand
Union Minister of Education &
Culture
Shastri Bhavan,
New Delhi-110 001.
...President

2. Dr. Yash Pal,
Director,
Space Applications Centre,
Jodhpur Tekra,
Ahmedabad-380 053.
...Chairman, Governing Body

3. Dr. M. S. Swaminathan,
Director-General,
Indian Council of Agricultural
Research,
Krishi Bhavan,
New Delhi-110 001.

4. Dr. A. K. De
Director,
Indian Institute of Technology,
Powai, Bombay-400 076.

5. Shri M. S. Parthasarathy,
Standard Pencil Factroy,
Super A-5, 6-Industrial Estate,
Madras-600 032.

6. Shri R. N. Mirdha,
17 Safdarjung Road,
New Delhi-110 003.

7. Dr. S. T. Satyamurthi,
Shri Jayachamarajendra Art
Gallery, Mysore.

8. Dr. (Miss) A. Chari,
Director,
Krishnamurti Foundation
Rajghat Education Centre,
Rajghat Fort,
Varanasi-221 001.

9. Dr. Atma Ram,
36, Central Vista Hostel,
Dr. Rajendra Prasad Road,
New Delhi-110 001.

10. Dr. A. N. Bsoe,
293/1, Raja Rammohan Ray
Road, Calcutta-700 041.

*11. Shri M. N. Deshpande,
Adviser, Nehru Centre,
Sterling Centre,
Dr. Annie Besant Road,
Bombay-400 018.

*12. Dr. (Mrs.) Madhuri Shah,
Vice-Chancellor,
SNDT University,
1, N. Thackersey Road,
Bombay-400 002,

*13. Prof. A. N. Bose,
National Council of Educational
Research & Training,
Sri Aurobindo Marg,
New Delhi-110 016.

*14. Shri Y.N. Gangadhara Shetty,
Managing Director,
Ramkumar Mills (P) Ltd,
Sudhama House,
Bangalore-560 053.

*15. Shri B. P. Poddar,
2. Gurusaday Road,
Calcutta-700 019.

*16. Shri S. Gorakshkar,
Director,
Prince of Wales Museum,
Fort, Bombay-400 001.

17. Prof. M.G.K. Menon,
Secretary, DST & Director
General,
Scientific & Industrial Research
Technology Bhavan,
New Mehrauli Road,
New Delhi-110 029.

18. Shri Mahatab Singh,
Dy. Secretary,
Department of Science &
Technology,
Technology Bhavan,
New Mehrauli Road,
New Delhi-110 029.

*19. Shri J. A. Kalyanakrishnan,
Financial Adviser,
Ministry of Education, &
Culture, Shastri Bhavan,
New Delhi–110 001.

*20. Shri Mir Nasrullah,
Addl. Secretary,
Deptt. of Culture,
Ministry of Education &
Culture, Shastri Bhavan,
New Delhi-110 001.

*21. Dr. Saroj Ghose,
Director,
National Council of Science
Museums,
19A, Gurusaday Road,
Calcutta-700 019

**22. Shri T. K. Ray,
Secretary,
National Council of Science
Museums,
19A, Gurusaday Road,
Calcutta-700 019.
...Non-Member Secretary.

*** Denotes members of Governing Body.**

**** Non-Member Secretary of Governing Body also.**

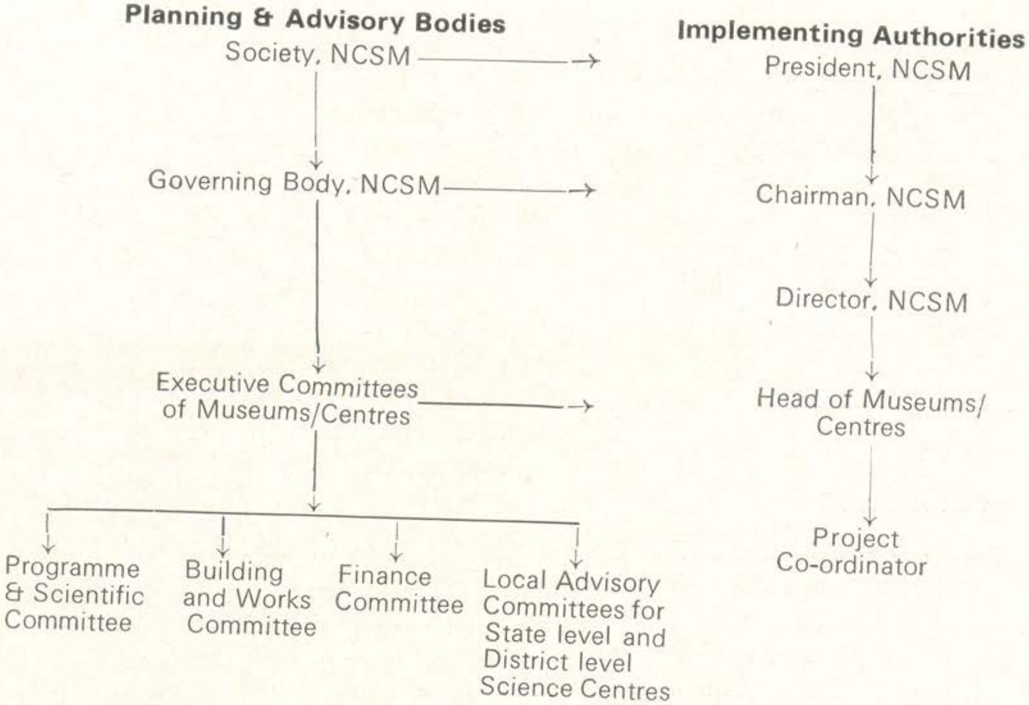
Following are also members of the Governing Body:

1. Dr. Amarjit Singh,
Director, C.E.E.R.I.
Pilani, Rajasthan.

2. Shri R. M. Chakraborti,
Senior Curator, VITM
Kasturba Road,
Bangalore-560 001.

3. Shri S. K. Bagchi,
Senior Curator,
Birla Industrial & Technological Museum,
19A, Gurusaday Road,
Calcutta-700 019.

ORGANISATION CHART FOR THE NATIONAL COUNCIL OF SCIENCE MUSEUMS


Planning & Advisory Bodies
Society, NCSM
Governing Body, NCSM
Executive Committees of Museums/Centres
Programme & Scientific Committee
Building and Works Committee
Finance Committee
Local Advisory Committees for State level and District level Science Centres
Implementing Authorities
President, NCSM
Chairman, NCSM
Director, NCSM
Head of Museums/ Centres
Project Co-ordinator

PERSONNEL

Dr. Saroj Ghose has taken over as the Director of National Council of Science Museums with effect from April 7, 1979. Prior to this assignment, Dr. Ghose held the charge of Nehru Science Centre, Bombay since January 1976 and of Birla Industrial & Technological Museum, Calcutta since April 1965. He has been the Vice-President of the International Committee for Education & Cultural Action of ICOM since 1974 and a member of the Executive Committee of the same International Committee from 1968 to 1974.

APPOINTMENTS

BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Shri R. K. Mehrotra	Curator B
Shri R. S. Chowdhury	Curator B
Shri M. K. Mukherjee	Junior Doc. Officer
Shri Samir Kumar Roy	Senior Scientific Asstt.
Shri S. K. Basu	Senior Scientific Asstt.
Shri P. N. Mallik	Senior Scientific Asstt.
Shri B. Roychowdhury	Senior Scientific Asstt.
Shri A. K. Sarkar	Artist-cum-Modeller
Shri P. B. Mistry	Dark Room Asstt.
Shri D. Lama	Lower Division Clerk
Shri P. C. Mandi	Lower Division Clerk
Shri A. K. Pal	Lower Division Clerk
Shri R. C. Sil	Lower Division Clerk
Shri A. K. Dhar	Lower Division Clerk
Smt. B. Biswas	Peon
Shri Rabin Das	Photo Attendant
Shri D. C Mandi	Workshop Attendant
Shri K. Mandi	Khalasi

VISVESVARAYA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Shri R. Nagaraja Rao	Engg. Officer, Gr. I
Shri C. V. R. Kumar	Senior Technical Asstt.
Shri K. G. Kumar	Senior Scientific Asstt.
Shri N. Shanmuga Sundaram	Artist (Layout)
Shri S. Kandasamy *	Assistant
Shri A. Muthukaruppan	Jr. Accountant
Shri K. P. Rangaswamy	H. T. Driver
Shri P. Subramani	Mechanic-cum-Fitter
Shri M. Gopala	Khalasi

*** (appointed on Foreign Service terms from Dept. of Telecommunications, Madras)**

NEHRU SCIENCE CENTRE

Shri D. K. Choudhury	Asstt. Executive Engineer
Shri Hanumant Lal	Finance & Accounts Officer
Shri G. S. Rautela	Senior Scientific Asstt.
Shri S. P. Roy	Senior Scientific Asstt.
Shri N. P. Shirke	Senior Artist
Shri S. M. Pawar	Junior Engineer (Hort)
Shri M. B. Gharker	Senior Mechanic
Miss M. M. Sawant	Lower Division Clerk
Shri V. R. More	Lower Division Clerk
Shri S. K. Rane	Senior Mechanic
Shri J. T. Khandalekar	Senior Mechanic
Shri V. M. Chopde	Senior Mechanic
Shri D. A. Uchil	Trainee (Guide Lecturer)
Shri S. A. Raut	Trainee (Guide Lecturer)

SRIKRISHNA SCIENCE CENTRE

Shri B. Kumar	Senior Scientific Asstt.
Shri R. N. Jaiswal *	Jr. Accountant
Shri S. N. Ghosh	Jr. Engineer (Civil)
Shri B. K. Verma	Jr. Stenographer
Shri A. K. Chandra	Sr. Mechanic (Electronics)
Shri Jay Prakash Singh	Sr. Mechanic (Sheet Metal)
Shri Ambika Prasad	Sr. Mechanic (Carpentry)
Shri Lakhan Mistry	Artist (Trainee)

*** (on deputation from A. G. Bihar, Ranchi)**

NATIONAL COUNCIL OF SCIENCE MUSEUMS (Head Quarters)

Dr. Saroj Ghose	Director
Shri T. K. Ray	Secretary
Shri C. N. Ganeshan	Senior Scientific Asstt.
Shri S. Chakraborty	Upper Division Clerk
Shri B. N. Mukherjee	Upper Division Clerk

PROMOTIONS

BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Mrs. I. Sandhu	Scientist A1
Shri S. K. Roychowdhury	Scientist A1
Shri R. K. Chakraborty	Fine Mechanic
Shri Hatem Ali	Fine Mechanic
Shri R. K. Kundu	Fine Mechanic
Shri Nimai Chandra Sarkar	Sup. Mechanic
Shri S. S. Biswas	Record Keeper

VISVESVARAYA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Shri D. K. Murthy	Programme Asstt.
Shri Venkatachalapathy	Artist-cum-Modeller
Shri Riyazulla Shariff	Fine Mechanic
Shri Narayana Rao	Attendant (skilled)
Shri K. Ramanjulu Naidu	Record Keeper
Shri G. Subramani	Liftman

TRANSFERS

NATIONAL COUNCIL OF SCIENCE MUSEUMS
(Head Quarters)

Shri R. Chakraborty	Sr. Personal Asstt.

VISVESVARAYA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Shri A. C. Chandy	Section Officer

NEHRU SCIENCE CENTRE

Shri S. R. Bapat	Executive Engineer
Shri K. V. C. Sekharan	Finance & Accounts Officer
Shri M. R. Kapoor	Section Officer
Shri S. B. Kanade	Section Scientific Assistant
Shri K. G. Ravindranath	Store Supervisor
Shri Bhor K. Janaj	Lower Division Clerk
Shri G. B. Gadge	Driver

RESIGNATIONS

BIRLA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Shri B. Roychowdhury	Senior Scientific Asstt.
Shri D. N. Saha	Lower Division Clerk
Shri D. Lama	Lower Division Clerk
Shri K. Mandi	Khalasi

VISVESVARAYA INDUSTRIAL & TECHNOLOGICAL MUSEUM

Smt. Sarala Uttangi	Jr. Librarian
Shri S. P. Chandran	Watch-man
Shri S. Arul Das	Attendant (Skilled)

NEHRU SCIENCE CENTRE

Dr. A. K. Ghosh	Curator C (Resignation to be accepted)
Shri A. R. Mohanty	Curator B (Resignation to be accepted)